AUTHOR INDEX

A

Abarbannel, A. R., 356 Abderhalden, E., 126, 601 Abelin, I., 207 Abelson, N. B., 516 Abernethy, T. J., 528 Abramson, H. A., 526 Ackermann, H., 522 Acree, F., 542, 543 Adair, G. S., 121, 133, 135, 136, 137 Adair, M. E., 121, 133, 135, 136, 137 Adams, A. E., 348 Adams, G. A., 488, 489 Adams, J. R., Jr., 523 Adams, M. H., 508, 522, 596, 608 Adams, M. S., 608 Adamson, J. D., 297 Adler, E., 422 Adlersberg, D., 265 Agner, K., 2 Agranat, V., 102 Agren, G., 39 Ahlstrom, L., 458 Akeley, R. V., 323 Akeson, A., 2 Alba, R. T., 41 Albanese, A. A., 124, 251, 255, 256, 257, 259 Albaum, H. G., 411, 420, 422 Albers, E., 460 Albers, H., 460 Albertson, N. F., 145 Albrecht, G., 145 Albury, M., 330 Alderton, G., 120, 121 Alekseeva, T. S., 585 Alexander, B., 299 Alexander, H. E., 508 Allen, P. J., 426 Allen, R. J. L., 419, 420 Allen, T. C., 548, 549 Allers, R. A., 596 Alles, G. A., 594, 595, 600, 601, 606 Alliende, J., 351 Alling, E. L., 251 Almon, L., 505, 522 Almquist, H. J., 263, 265, 388 Alperstein, B. B., 515

Ames, S. R., 10, 258, 330 Amler, M. H., 367 Ammon, H., 305 Amos, B., 290 Anchel, M., 234 Anderson, A. B., 44 Anderson, A. R., 181 Anderson, D. G., 510, 511 Anderson, D. H., 227 Anderson, E. H., 391, 452 Anderson, F. W., 251 Anderson, G., 331 Anderson, G. W., 516 Anderson, K., 525 Anderson, R. C., 176, 177, 210, 279 Anderson, R. J., 103 Anderson, R. K., 298, 300 Anderson, R. S., 588 Anderson, T. F., 578, 587 Anderson, W. M. E., 559 Anderson, K. J. I., 131 Angier, R. B., 280, 387 Anigstein, L., 310 Annau, .E., 233 Anson, M. L., 402, 403 Antoniani, C., 464 Appel, H., 234 Applebaum, E., 361, 362 Arant, F. S., 545 Archer, S., 145 Archibald, R. M., 45, 203, 259 Archibold, H. K., 415, 418 Armstrong, S. H., Jr., 119 Armstrong, W. D., 361, 363, 364, 368 Arnaudi, C., 483 Arney, S. E., 419, 420 Arnold, E. H., 554 Arnold, F. A., Jr., 367, 369 Arnolt, R. I., 611 Aron, E., 66 Arrhenius, S., 128 Arth, G. E., 279

Arthur, J. M., 552, 566 Artom, C., 108, 222, 257 Aschner, M., 203, 499 Asdell, S. A., 304 Ashburn, L. L., 288 Asmundson, V. S., 308 Astbury, W. T., 129, 144 Atkin, L., 385, 452 Atkins, C. D., 327 Atkinson, T. T., Jr., 219 Aubert, E. F., 519 Auerhauer, A. H., 489 Augustinsson, K. B., 63 Auhagen, E., 457 Ault, W. C., 103 Aumuller, W., 177 Avery, G. S., 422, 423 Avineri-Shapiro, S., 89, 90, 203, 499 Axelrod, A. E., 280, 291, 377 Axelrod, B., 9 Axelrod, H. E., 256, 307, Azarkh, R. M., 23, 255, 497

B

Baba, T., 420, 465 Bach, S. J., 262 Back, R. C., 566 Bacon, C. W., 541 Bacq, Z. M., 596, 597. 608 Baddiley, J., 20, 56, 252, 385 Bader, M. N., 310 Badger, E., 378 Badhwar, R. L., 549 Baer, E., 8, 248, 451 Bailey, A. E., 93, 100, 105 Bailey, C. C., 203, 206 Bailey, G. F., 327 Bailey, J. H., 14 Bailey, K., 129, 135, 459 Bailey, O. T., 206 Bain, W. A., 611 Baird Associates, 412 Baird, E. A., 493 Baird, G. R., 483 Bajilina, G. D., 130 Baker, E. E., 525 Baker, H., 555

Baker, L. C., 323 Bakker, A., 53 Baldwin, A. R., 94, 95, 106, 224 Baldwin, E., 525 Baldwin, H. L., 292, 457 Baldwin, M. E., 76 Baldwin, R. A., 230 Baldwin, R. R., 79, 80 Bale, W. F., 250 Bales, M. S., 367 Ball, E. G., 445, 458, 597, 599 Ball, R. S., 544 Balla, G., 178 Ballentine, R., 25, 293, 381, 389, 494 Ballou, G. A., 35, 133, 141, 143 Balls, A. K., 9 Bamann, E., 460, 461 Banerjee, S., 203, 204, 287 Bantz, A. C., 380, 481, 489 Barach, J. H., 219 Barber, G., 184 Barberie, M., 326 Barboni, F., 226 Barcroft, J., 110, 220, 238 Bard, S., 582 Barger, G., 181, 186 Barker, H. A., 50, 87, 89, 229, 418, 477, 478, 480, 485, 487, 491, 492, 497, 498 Barnell, H. R., 419 Barnes, L. A., 521 Barnes, R. B., 95 Barnes, R. H., 99, 113 Barnes, Sarah, 555 Barnett, J. W., 381 Barnfield, W. F., 370 Barranscheen, H., 420 Barron, A. G., 426 Barron, E. S. G., 12, 27, 198, 228, 426, 445, 458 Barron, N. S., 53 Barry, V. C., 441 Bartels, W. E., 281 Barthel, W. F., 541, 542, 560 Bartlett, M., 299 Bartlett, M. C., 3 Bartlett, P. D., 553 Barton-Wright, E. C., 388, 423 Batchelder, C. H., 555 Bateman, I., 302

Bates, F. L., 79, 80 Bath, J. D., 134, 135 Batho, H. F., 412 Bauer, E., 459 Bauer, S. T., 105 Bauer, W. H., 367 Bauernfeind, J. C., 315, 386 Baumann, C. A., 256, 307 Baumberger, J. P., 46, 436 Baur, F. J., 108 Bawden, F. C., 512, 575, 576, 583, 585, 586, 587 Baxter, J. G., 275, 276, 316 Baxter, R. A., 159 Bayard, P., 220 Bayer, G., 602 Bayfield, E. G., 324, 331 Bayles, T. B., 110 Beadle, B. W., 95, 96 Beadle, G. W., 259, 377, 382, 390 Beale, H. P., 505, 506 Bean, H. W., 112 Bear, R. S., 76, 77, 79, 80 Beard, D., 133, 577, 578, 579, 582 Beard, H. H., 291 Beard, J. W., 133, 513, 577, 578, 579, 582 Beatty, C. H., 212 Beauvillain, A., 351 Beckman, A. O., 95 Beckord, L. D., 61, 497 Becks, H., 365, 366 Behm, R. C., 599 Behnke, J., 528 Behrens, M., 463 Beinhart, E. G., 106 Beland, E., 348 Bell, R. C., 181, 182 Bellamy, W. D., 20, 55, 56, 57, 252, 253, 254, 278, 385, 386, 388. 391, 495 Bellows, J. W., 365 Beloff, A., 39, 54 Belozersky, A. N., 130 Belval, H., 418, 419 Benend, W., 442 Benesch, R., 53, 282, 283, 293 Bennet-Clark, T. A., 418, 428 Bennett, G., 443 Bennett, L. L., 208

Bennett, M. A., 264 Benoit, G. J., Jr., 266 Bentley, L. S., 304 Beraud, P., 439 Berg, R. L., 462, 463, 464 Bergeim, O., 370 Berger, J., 422, 423 Berger, L., 199 Bergmann, M., 42 Bergold, G., 573 Berkman, S., 379 Berl, S., 325 Berman, D., 348 Bernard, H., 508 Bernard, R., 53. Bernatowicz, L. J., 296 Bernfeld, P., 49, 76, 79, 81 Bernhard, K., 224, 231, 248 Bernhardt, H., 607 Bernheim, F., 10, 26, 27, 44, 256, 480, 562, 594, 601, 604, 608, 610 Bernheim, M. L. C., 10, 26, 27, 44, 256, 480, 593, 594, 601, 604, 608, 610 Bernstein, D. E., 479 Bernstein, L., 323 Bernton, H. S., 525, 526 Berridge, N. J., 42, 67, 120 Berry, L. J., 301 Berry, M. H., 303 Bertrand, D., 4 Bertrand, J., 44 Bessey, O. A., 306, 314 Beuk, J. F., 321 Bevelander, G., 367 Beveridge, J. M. R., 124. 233, 264 Bexon, D., 428 Beyer, K. H., 204, 594, 595, 598, 599, 600, 601, 602, 605, 606, 607, 610 Bezer, A. E., 510, 511, 514, 519 Bezssonoff, N., 2, 277 Bhagvat, K., 425, 596, 603, 608 Bialock, J. V., 315 Bibby, B. G., 364, 367, 368, 369 Bier, O., 511 Bier, O. G., 527 Bierbaum, O. S., 284

Bige

Bina

Bing

Bink

Birc

Bird

Birk

Birs

Bisc

Bjer

Bjo

Blac

Blac

Blac

Blac

Blai

Blan

Blan

Bla

Bla

Bla

5

5

6

Ble

Ble

Blis

Blis

Blo

Blo

Blo

Blo

Blo

Blo

Blo

Blo

Bo

Bo

Bo

Bo Bo

Bo

Bo

Bo

Bo

Bo

Bo

Bo

Bo

Be

2

Blo

31

42

50

Bigelow, N. M., 167 Bina, A. F., 315 Binder, M., 521 Bing, R., 604 Binkley, F., 258, 492, 509, 521 Birch, T. W., 426 Bird, O. D., 280, 308, 318, 387 Birkinshaw, J. H., 6, 423 Birsen, T., 604 Bischoff, F., 133, 350 Bjerknes, C., 523 Bjorneboe, M., 160, 508 Black, A., 123 Black, J., 515, 521 Black, R., 350 Blackman, F. F., 430 Blackstock, E., 552 Blair, C. B., 209 Blanchard, K. C., 457 Blanchard, M., 5, 262 Blanchard, R. A., 555 Blank, F., 178 Blaschko, H., 11, 20, 57, 58, 253, 426, 594, 595, 596, 597, 598, 603, 604 Blewett, M., 311 Bleyer, B., 438 Bliss, C. I., 311, 564 Bliss, L., 86 Bloch, A., 277 Bloch, K., 17, 164, 196, 237, 248, 259, 262, 486 Block, R. J., 124, 444 Blohm, C. L., 600, 601 Blom, R. H., 489 Bloom, E. S., 280 Bloor, W. R., 230, 303 Blotner, H., 211 Blotter, L., 123 Blout, E. R., 166, 179, 180 Bodansky, O., 66 Bodecker, C. F., 367 Bodine, J. H., 4 Boell, E. J., 66 Bohart, G. S., 109 Bohn, H., 234 Bohonos, N., 385 Bohren, B. B., 304 Boichenko, E. A., 404 Bois, R. S., 76 Boldt, M. H., 511, 515 Bolin, D. W., 315 Bolland, J. L., 104 Bolling, D., 124, 444

Bollman, J. L., 110 Bolyard, M. N., 95 Bonanto, M. V., 515 Bondareva, S. P., 227 Bone, R., 518 Bonner, D., 294, 377, 426 Bonner, J., 364, 423, 426 Bonner, J. F., 367 Boor, A. K., 522 Boorman, K. E., 519 Booth, R. G., 230, 423 Booth, V. H., 53, 312 Boothe, J. H., 280, 387 Booy, H. L., 435 Borei, H., 11, 437 Borgman, K., 128 Bornstein, B. T., 485 Bornstein, S., 505, 522 Borozdina, A., 541 Borsook, H., 265, 296 Borthwick, H. A., 409 Boswell, J. G., 423, 424 Bottcher, I., 182 Boulanger, P., 44 Bourdillon, J., 582 Bourne, E. J., 50, 81, 82, 83, 84, 202, 366 Bourque, J. E., 251, 255 Bourquin, J. P., 279 Boutwell, R. K., 225, 230, 309, 317 Bovarnick, M., 520 Bovarnick, M. R., 379 Bovingdon, H. H. S., 550 Bowden, F. C., 582 Bowen, C. V., 540, 541 Bowman, D. E., 350 Boxer, G. E., 225 Boyce, A. M., 551 Boyd, J. D., 368 Boyd, W. C., 505, 506, 508, 520, 528 Boyer, P. D., 35, 51, 133, 141, 143, 436 Boyes-Watson, J., 138 Boyland, E., 458 Boyle, P. E., 362 Boysen-Jensen, P., 417 Bracey, P., 565 Bradbury, J. T., 350 Bradford, E. A. M., 332 Brahmachari, H. D., 211 Brand, E., 119, 123, 124, 126, 145, 353 Brand, E. J., 444 Brandt, K., 445 Brandt, K. M., 454 Brante, G., 109, 233

Brauer, R. W., 66 Braun, K., 300 Braun, W., 302, 303 Braunstein, A. E., 21, 23, 255, 438 Bray, H. G., 522 Breen, J., 436 Breinl, F., 506 Breneman, W. R., 350 Bresler, S. E., 130 Bressler, B., 318 Bretano, W., 76 Breusch, F. L., 15 Brice, B. A., 96 Bridges, W. C., 355 Briggs, A. P., 301 Briggs, D. R., 131, 142 Briggs, G. M., 280, 295, 318 Briggs, L. H., 181, 182, 183, 184, 185 Briscoe, H. V. A., 563 Britton, S. W., 212 Brode, W. R., 95 Brodsky, R. H., 368 Brody, J. K., 320 Brohult, S., 128 Bromberg, Y. M., 300 Bromel, H., 248, 439, 451 Brooks, J., 110 Broom, W. A., 353 Brown, A. E., 144, 450 Brown, D. H., 511, 527, 528 Brown, E., 226 Brown, E. B., 315 Brown, E. F., 230, 303 Brown, G. B., 256, 376, 377 Brown, J. B., 93, 97, 101, 108, 110, 219, 221, 226 Brown, O. W., 248 Brown, R. A., 292, 318, 380, 387 Brown, R. W., 229, 478, 484 Brozek, J., 298 Bruce, W. F., 385, 386, 388 Bruckmann, G., 204 Brudevold, F., 364 Brugger, C., 256 Bruk, D., 430 Brunauer, S., 138 Brunn, L. K., 548, 549 Brunschwig, A., 207 Brush, M. K., 330 Bryan, W. R., 574

Bryden, J. H., 511, 527, 528 Brzezinski, A., 300 Buc, S. R., 145 Buchanan, J. M., 16, 24, 196, 197, 235, 259, 488 Bucher, H., 179 Bucherer, H., 500 Buchman, E. R., 277 Buchner, E., 438 Buckles, R. E., 158 Bueding, E., 211 Bukantz, S. C., 515, 528 Bull, H. B., 53, 127, 133, 137, 138, 139 Bullet, F., 224, 231 Bullowa, J. G. M., 515 Bunde, C. A., 211, 239 Buntin, H., 221 Bunting, A. H., 420, 421 Bunting, R. W., 361 Buonocore, M. G., 369 Burkard, J., 87, 420 Burkholder, P. R., 294, 379 Burn, C. G., 365 Burn, J. H., 240 Burnet, F. M., 581 Burnham, L., 516 Burr, G. O., 9, 98, 99, 104, 108, 113, 227, 313 Burrell, H., 458 Burrell, R. W., 554 Burris, R. H., 412 Burrows, B. A., 263 Burstrom, H., 411 Burt, R. L., 362 Busch, G., 497 Buschke, W., 286 Bushland, A. C., 553 Busvine, J. R., 563 Butenandt, A., 157, 160, 584 Buu-Hoi, N. P., 103, 163 Buxton, P. A., 554, 555 Bychkov, S. M., 23

C
Cadden, J. F.. 596, 608
Cagniant, P., 103, 163
Cailleau, R., 329
Calandra, J. C.., 368, 490
Caldwell, A. B., 285
Caldwell, E., 322
Caldwell, J., 417
Caldwell, M. J., 312
Caldwell, M. L., 13, 59, 61

Caldwell, T. D., 144 Calkins, D. G., 280 Callison, E. C., 285, 311 Calvery, H. O., 557 Campbell, C. J., 280, 292, 318, 387 Campbell, D. H., 132, 505, 507, 511, 525, 526, 527, 528 Campbell, G. A., 555, 563 Campbell, H. L., 285, 302 Campbell, I. G. M., 543 Campbell, J. A., 311 Campbell, J. J. R., 490 Campbell, R., 331 Campbell, T. E., 382 Cambier, M. J., 515 Camien, M. N., 123 Cammoroti, M. S., 264 Cannan, R. K., 124, 125 Cannon, H. J., 315 Cannon, M. D., 317 Cannon, P. R., 263, 505, 515 Cantarow, A., 11, 24 Cantoni, G., 607 Cantor, M. M., 313 Caputto, R., 8 Caravon-Gentil, Mdm., 109 Cardini, C. E., 219, 220 Caroline, L., 436 Carpenter, C. M., 508, 522 Carpenter, D. C., 145 Carpenter, L. E., 385 Carpenter, T. M., 210, 240 Carpousis, A., 368 Carreyett, R. A., 112 Carrick, C. W., 304 Carroll, J. J., 181, 182, 184 Carroll, W. R., 449 Carter, C. W., 290 Carter, G. S., 352 Carter, W., 558, 559 Cartland, G. F., 593 Casanges. A. H., 550 Cassidy, H. G., 125 Cassie, A. B. D., 139 Castañeda-Agulló, M., 35, 67 Castelli, T., 464 Castor, J. G. B., 426 Caswell, M. C., 123

Cateno, C., 47 Caul, J. F., 308 Cavallito, C. J., 14 Cayer, D., 300 Cerecedo, L. R., 231, 310 Chaikoff, I. L., 108, 219, 222, 232, 264, 292, 315 Chaix, P., 1, 47, 492, 493 Chalkina, O. M., 577 Chalmers, T. A., 275 Chalopin, H., 230 Chambers, D. C., 525 Chambers, G. H., 351 Chambers, J. A., 578 Chambers, V. H., 556 Chandler, J. P., 264 Chandler, R. C., 135 Chaplin, H., 494 Chargaff, E., 46, 93, 113, 219, 397, 492, 525, 580 Charipper, H. A., 352 Chase, J. H., 348, 517, 518 Chase, J. T., 324, 328 Chase, M. W., 515, 530 Chauchard, P., 304 Chaudhury, A. K. R., 49 Cheldelin, V. H., 318, 326, 380, 382, 383, 389 Chem, T. M., 426 Chen, A. L., 176, 177 Chen, C., 105 Chen, H., 181, 185, 186 Chen, H. K., 455 Chen, K. K., 176, 177, 206, 210, 607 Chen, L., 312 Chen, T. T., 597, 599 Cheney, L. C., 280 Cheney, R. H., 12 Chester, R. M., 61 Chi, Y. F., 186 Chibnall, A. C., 119, 124, 125 Child, R., 100 Chipault, J. R., 313 Chisholm, R. D., 553 Chopra, R. N., 549 Chornock, C., 365 Chou, T. Q., 186 Chow, B. F., 518 Christensen, H. N., 145 Christensen, L. R., 40, 41 Christenson, R. M., 101 Christian, W., 8, 439, 447, 451 Christiansen, J. B., 316

Chu, E. J.-H., 276, 389

Chu

Cie

Cin

Cis

Cla

Cla; Cla; Cla;

Cle

Cle

Cle

Clif

Cob

Coc

Coff

Cog

Cog

Cog

Cob

Coh

Col

Coh

Coh

Coh

Col

Col

Coli

Col

Col

5

3

4

Col

Col

Col

Con

Con

Con

Con

Cor

3

5

5

1

1

4

5

3

3

Chu, T. T., 166 Ciereszko, L. S., 347 Cinki, R., 506 Ciszewski, W. E., 207, 301 Claesson. S., 125 Clapp, F. L., 506, 507 Clapp, R. C., 377 Claren, O. B., 454 Clark, A. J., 608 Clark, D. E., 232 Clark, J. H., 133 Clark, L. B., 412 Clark, P. F., 231, 305, 309, 582 Clarke, T. H., 105 Claude, A., 111, 374 Clay, W. A., 263 Clayson, D. H. F., 427 Cleaver, C. S., 125 Clemo, G. R., 184 Clewer, H. W. B., 181, 184 Clifton, C. E., 439, 453, 481, 482, 491 Coburn, A. F., 457 Coca, A. F., 426, 505, 530 Coffin, G. S., 526 Coggeshall, L. T., Coghill, R. D., 489 Cogswell, R. C., 300 Cohee, R. F., Jr., 328 Cohen, A. L., 452, 465 Cohen, P. P., 21, 22, 56, 58, 254, 278, 495, 496 Cohen, S. S., 42, 509, 525, 579 Cohn, E. J., 119, 120, 133, 136, 137, 578 Cohn, E. W., 211 Cohn, M., 248, 264 Cole, Q. P., 377, 386, 387 Coleman, D., 132 Colin, H., 418 Collins, D. A., 365 Collyer, M. L., 294, 381 Colowick, S. P., 6, 50 51, 198, 199, 203, 209, 350, 353, 438, 445, 450, 458 Colvin, D., 329 Colwell, A. R., 353 Colwell, C. A., 14 Comar, C. L., 409 Commoner, B., 423 Comstock, R. E., 322 Condiff, H., 314 Conklin, G. E., 101

45

01

16

89

Conn, J. E., 14, 375, 376 Conn, J. W., 208, 350 Consden, R., 126, 255 Consolazio, F. C., 281, 297, 315 Conte, E. D., 348 Contreras, L. A., 281 Conway, E. J., 436 Cook, A. H., 408 Cook, E. S., 465 Cook, E. T., 207 Cook, J. W., 155 Cooley, M. L., 316 Coolidge, M. H., 324 Coombs, R. R. A., 516 Cooper, F. S., 523 Cooper, G. R., 141, 142, 582 Cooper, J. A., 133, 512, 513 Cooper, M., 144 Cooperman, J. M., 306, 309 Coover, H. W., Jr., 385, 386, 388 Cope, O., 39 Copley, M. J., 129, 144 Copping, A. M., 423 Corwin, W., 211 Corey, R. B., 119, 145 Cori, C. F., 8, 48, 49, 51, 67, 82, 83, 84, 85, 121, 198, 199, 201, 209, 353, 438, 450 202, Cori, G. T., 8, 48, 49, 67, 82, 83, 84, 85, 121, 198, 201, 202, 209, 450 Corre, L., 515 Corson, M. E., 293, 381 Cortesi, R., 166 Corteggiani, E., 109 Cortell, R., 352 Coryell, M. N., 320, 321 Cosby, E. L., 9, 11, 227 Cosulich, D. B., 280, 387 Cotter, J. W., 285 Cottet, J., 610 Coulson, E. J., 525 Coulthard, C. E., 6, 423 Cowgill G. R., 219 Cox, A. J., 365, 368, 564 Cox, W. M., Jr., 251 Coyne, F. P., 550 Cragg, J. M., 422 Craig, H. W., 513 Craig, L. C., 186, 541 Crandall, D. I., 200 Craver, B. N., 220 Credner, K., 257

Creech, H. J., 144 Crisman, J. M., 608 Cristol, S. J., 553 Croft, P. B., 264 Cronin, A. G., 465 Crook, A., 325 Crook, E. M., 262, 427, 587 Cross, M. C. A., 302 Crossley, F., 607 Crowfoot, D., 129, 134, 135, 138, 585 Croxatto, H., 351, 355 Croxatto, R., 351, 355 Cruickshank, E. M., 326 Cruz-Coke, E., Culpepper, G. H., 553 Cunningham, E., 278 Curran, J. E., 101 Cushing, J. E., 132, 507 Custers, M. T. T., 467 Cutkomp, L. K., 65, 562

Daasch, L., 77 Dale, P. P., 367, 369 Dalphin, C., 455 Daly, M. E., 321 Dam, H., 231, 287, 366 Damm, H., 225 Damodaran, M., 422 Dangschat, G., 564 Daniel, L., 294, 324, 386 Daniels, F., 399 Dann, W. J., 422 Darby, W. J., 27, 156, 256, 288, 601 Darling, R. C., 299 Darling, S., 125 Darlington, C. D., 575 Datta, N. C., 426 Daubert, B. F., 95, 96, 99, 105 Davenport, H. E., 122 Davenport, H. W., 52 David, J. C., 607 David, W. A. L., 565 Davidson, J., 61 Davidson, J. L., 301 Davies, R., 229, 486 Davis, B. D., 119, 505, 512, 513, 514, 510, 518 Davis, F. H., 296 Davison, C., 219 Dawson, C. R., 4, 423, 426, 602 Dawson, R. F., 541 Day, C. D. M., 368

Day, H. G., 49, 85, 202 Day, P. L., 292, 387 De, S. S., 121 Deakins, M., 362, 363, 369, 370 Deal, C. C., 290, 307 Dearborn, R. B., 426 Dearstyne, R. S., 322 de Boissezon, P., 111 Decaneus, D., 25 Deck, E. M., 97 Deckert, W. A., 607 deDuve, C., 210 de Eds, F., 365 DeFalco, R. J., 524 DeGara, P. F., 515 Deichmann, W. B., 610 de la Balze, F. A., 353 De la Mare, P. B. D., 101, 107, 221 de la Maza, J., 351 Delaunay, A., 110 Delbruck, M., 582 Del Fierro, R. S., 353 Delfs, E., 350 DeLong, D. M., 551 De Meio, R. H., 27, 256, 601, 611 DeMonbreun, W. A., 525 Denier, C. C., 554 Denton, R. L., 516 De Ritter, E., 315 Derouaux, G., 353 Derrien, Y., 121, 130 Desnuelle, P., 492, 493 DeSpain Smith, L., 523 Dessauer, G., 367 De Suto-Nagy, G. J., 113 De Turk, W. E., 12 Deuel, H. J., Jr., 211, 225, 226, 234, 274, 297, 302, 458 Deutsch, H. F., 143 Devine, J., 274, 607 Devlin, H. B., 251, 255 Dewey, V. C., 386, 387, 390 De Witt, J. B., 316 DeWitt, T. W., 399 Dexter, L., 355 Diamond, L. K., 516 Dick, G. F., 240 Dicke, R. J., 548, 549 Dickeison, D. C., 225 Dickens, F., 447 Dickinson, S., 129 Dickson, A. D., 61 Diemair, W., 426, 439

Dieterle, H., 184 Dietrich, K. R., 455 Dikanowa, A., 87 Dill, L. V., 596, 608 Dillard, G. H. L., 224 Dillon, T., 441 Dills, L. E., 551 Dimick, K. P., 145 Dingle, J. H., 505, 578 Dirr, K., 442 Dirscherl, W., 155, 462 Dische, Z., 451 Diskant, E. M., 123, 353 Dittmer, K., 203, 256, 376, 377 Dixon, K. C., 430 Dixon, M., 8, 594 Doan, C. A., 301 Dobbert, N. N., 497 Doctor, N. S., 426 Dodd, B. E., 519 Dodds, A. F., 499 Dodge, E., 25, 197 Doebbeling, A. H., 61 Doermann, A. H., 123, 259 Doetsch, R., 206 Doisy, E. A., Jr., 288, 464 Dolan, L. A., 279, 377 Dole, M., 401 Dollear, F. G., 97, 100 Donnelly, J., 422 Donovan, J. C., 251 Donowski, T. S., 300 Dore, W. H., 50, 89, 446 Dorfman, A., 379 Dorfman, F., 309 Dorland, R., 423 Dorrestein, R., 398, 400, 405, 407, 410 Dotti, L. B., 42 Doudoroff, M., 50, 87, 89, 202, 203, 418, 450, 467, 476, 481, 482, 489, 497, 498, 499 Dougherty, T. F., 348, 517, 518 Dove, W. E., 544 Dove, W. F., 323 Dowden, P. B., 555 Downer, A. W. E., 327 Downs, C. E., 42, 262 Dozois, T., 527 Drabkin, D. L., 6, 8, 26, 121, 198, 451 Dragiff, D. A., 370 Dragstedt, C. A., 505, Dragstedt, L. R., 232

Draize, J. H., 557 Drake, T. G. H., 325 Drake, W. L., 553 Drexter, L., 280, 293, 377 Drew, D. A., 102 Drey, N. W., 210, 239 Drobyshevskaya, A. I., 525 Duane, R. B., 301 Dubnoff, J. W., 265 Dubos, R. J., 505 Duchateau-Bosson, G., 598, 607 Dufait, R., 459 Duffy, E., 205 Duggar, B. M., 408 Dukler, N. E., 225 Duliere, W. L., 598 Dumm, M. E., 111, 224 Duncan, C. W., 290 Dunn, H., 515 Dunn, M. S., 123 Dunn, R. C., 557 Dunning, J. M., 368 Durlacher, S. H., 227 Duschinsky, R., 279, 377 Dutcher, R. A., 288, 289, 306, 330, 365 Dutton, D. F., 354 Dutton, H. J., 327, 408 duVigneaud, V., 203, 248. 256, 264, 279, 376, 377 Dwyer, I. M., 123 Dye, J. A., 207 Dye, M., 302 Dzialoszynski, L. M., 280

Eg

Eh

Eh

Eh

Eh

Eh

Ei

Ei

Ei

Eil Ek Ele

Ele

El

EI

El

El

El

EI

El

El

El

El

EI

E

E

E

E

E

E

E

E

E

E

E

E

E

E

E

E

Eaker, C. M., 553
Eakin, R. E., 383
East, B. R., 368
Eastcott, E. V., 459
Easterling, L., 290
Easton, N. R., 279
Ebeling, W., 555
Ecker, E. E., 510, 513, 516, 527
Eckert, J. E., 556
Edison, A. O., 305
Edibacher, S., 5, 257, 261
Edman, P., 355
Edsall, J. T., 130, 133, 578
Edson, N. L., 479
Edwards, F. C., 78
Eggerth, A. H., 514

AUTHOR INDEX

Eggleston, L. V., 15, 235, 427 Eheart, M. S., 329 Ehrenstein, M., 158, 160 Ehrhardt, G., 177 Ehrich, W. E., 516 Ehrlich, G., 247 Eichler, O., 220, 364 Eichoff, H. J., 398 Eide, P. M., 554 Eilbert, M. L., 232 Eklund, A. B., 331 Elderfield, R. C., 166. 175, 176, 178, 179, 180 Eldred, N. R., 57, 124, Ellinger, P., 278, 282, 283 Elliot, J., 514 Elliot, L., 422 Elliot, M. D., 368 Elliott, K. A. C., 10, 26 Elliott, R. F., 226 Elliott, S. D., 41, 524 Ellis, J. W., 134, 135, 159, 160 Elman, R., 265 Elsom, K. O., 231 Elvehjem, C. A., 10, 15, 23, 123, 225, 230, 231, 280, 251, 258, 285. 288, 289, 291, 292, 295, 305, 306. 307. 309, 317, 318. 328. 330, 332, 367, 379, 385, 398, 411 El'yashkevich, E. S., 227 Emerson, G. A., 206, 277, 278, 288, 291, 383 289, Emerson, R., 398, 399, 408, 410, 516 Emery, W. B., 388 Emmel, A. F., 287 Emmett, A. D., 292, 318, 387 Emmett, P. H., 138 Emmrich-Glaser, I., 234 Emmrich, R., 234 Emslie, A. R. G., 311 Enders, C., 500 Enders, J. F., 514 Enebro, L., 456 Engel, M. B., 362 Engelhardt, V. A., 453 English, J., Jr., 102 English, J. P., 377, 386, English, M. A., 307

3,

3,

Ennis, T., 250 Entenman, C., 108; 222, 232, 264, 292, 315 Eperjessy, A., 233 Epps, H. M. R., 19, 20, 55, 56, 57, 252, 253, 495, 496 Erickson, J. E., 513 Erickson, J. O., 506 Erickson, J. V., 132 Erickson, L. L., 283 Eriksson-Quensel, I. B., 38, 129 Erxleben, H., 259, 260, 261 Eryol, N., 132 Esafov, V. I., 103 Eschenbrenner, A. B., 1 Escudero, A., 227 Esselen, W. B., Jr., 327 Essex, H. E., 607, 609 Euler, H., 364, 422, 601 Evans, E. A., Jr., 7, 9, 17, 18, 125, 194, 195, 225, 445, 458 Evans, H. M., 123, 207, 265, 348, 349 Evans, J. B., 479 Evans, J. S., 206 Evans, R., 61 Evans, W. C., 599 Evensen, O. K., 211 Everett, G. M., 288 Everson, G. A., 383 Everson, G. J., 331 Ewing, G. W., 275 Ewins, A. J., 603 Eymers, J. G., 400 Eyring, H., 494

Faber, J. E., 370 Fahrenbach, M. J., 280, 387 Fairbairn, D., 62, 109, 221 Fairclough, M., 297 Falco, E. A., 388 Fales, J. H., 560 Falkenheim, M., 367 Falkenstein, A. P., 350 Fan, C. S., 401, 406 Fankuchen, I., 136 Fantl, P., 201 Fardig, O. B., 315 Farmer, S. N., 436 Farrer, K. T. H., 278 Farris, E. J., 350 Farsetta, K., 521 Favour, C. B., 251

Fedder, M. L., 552 Feldberg, W., 13, 24, 67 Felix, A., 525 Felix, K., 9 Fell, N., 526 Feller, A. E., 578 Felsenfeld, O., 499 Felton, J. R., 291 Fenton, F., 330 Ferguson, F. F., 554 Ferry, R. M., Jr., 308 Fessenden, R. W., 53 Feuge, R. O., 105 Feulgen, R., 604 Feustel, I. C., 145 Fevold, H. L., 120, 121, 145 Fidler, J. C., 421, 422, 430 Field, H., 301 Field, J., 26, 200, 608 Field, J. B., 265 Fieger, E. A., 391 Fieller, E. C., 353 Fierz, H. E., 529 Fieser, L. F., 155, 167, 170, 171 Fildes, P., 375, 376 Filer, L. J., Jr., 99, 105 Findley, T. W., 104 Fine, J., 250 Fink, E., 258 Fink, H., 438, 448 Fink, R. M., 250 Finland, M., 505 Finney, D. J., 564 Fischel, E. E., 331 Fischer, A. H., 459, 460, 461 Fischer-Dallman, R., 518 Fischer, E., 518 Fischer, H., 258 Fischer, H. O. L., 8, 451, 564 Fischer, O., 2 Fisher, A., 22, 59 Fisher, G. S., 313 Fishman, W. H., 257 Fisk, N. R., 94 Fitzhugh, O. G., 365 Fleming, W. E., 555 Florestano, H. J., 370 Florestand, H. J., 370 Florestand, M., 598, 607 Flower, D., 293, 377 Floyd, N., 57 Floyd, N. F., 17, 236, 238, 259, 264 Fodor, A., 38 Fodor, P. I., 38

Foeste, A., 305 Fohlen, G. M., 164 Folkers, K., 279, 384 Follensby, E. M., 512 Follis, R. H., Jr., 306 Fontaine, T., 62, 228 Fontaine, T. D., 35, 122, 142 Forbes, J. C., 219, 224 Ford, J. H., 145 Fosdick, L. S., 368, 370, 465, 490 Foster, A. Z., 508, 509 Foster, C., 309 Foster, G. L., 124, 247 Foster, J. F., 79, 80, 130 Foster, J. W., 385, 387. 483 Foust, C. E., 278 Fowler, R. C., 367 Fox, S. W., 277 Foy, J. R., 231 Fradkina, R. V., 515 Fraenkel, G., 311 Fraenkel-Conrat, H., 144, 354 Fraenkel-Conrat, H. L., 181, 184, 186 Frame, E. G., 204 Francis, T., 581 Franck, J., 18, 19, 398, 403, 404, 405, 408, 410 Franke, F. E., 523 Franke, W., 423, 479 Frankel, J., 584 Frankel, S., 596 Frankenthal, L., 461 Frankl, W., 123 Franks, M., 206 Frankston, J. E., 124, 157, 256, 257 Frantz, V. K., 507 Fraps, G. S., 274, 302, 311, 322 Fratkin, S. B., 481 Frazer, A. C., 61, 220, 229 Frazier, E. I., 315 Frazier, L. E., 263 Frear, D. E. H., 551 Freeman, A. F., 98 Freeman, G. G., 522 French, C. E., 226 French, C. S., 400, 402, 403, 404, 405, 408, 409, 410 French, D., 77, 78, 79, 80, 130 Freund, J., 514, 515 Frey, C. N., 385, 452

Freytag, R. M., 366 Fried, J., 178 Friedemann, T. E., 315 Friedenwald, J. S., 286, 601 Friedewald, W. F., 515, 577, 579, 580, 581, 588 Friedgood, C. E., 205. 206 Friedlander, H. D., 222 Friedman, L., 305 Friedrich-Freksa, H., 505, 506, 584 Frisbie, H. E., 361, 369 Fromageot, C., 1, 41, 47, 492, 493 Frommel, E., 66 Frommeyer, W. B., 300 Front, J. S., 96 Frontjes, W., 595 Frush, H. L., 446 Fry. E. G., 111, 207 Fuhrman, F. A., 26, 200, Fuhrman, G. J., 608 Fujiki, T., 11 Fullam, E. F., 574 Fuller, W. H., 490 Fulmer, E. I., 481, 489 Furst, A., 178, 179 Furter, M. F., 383 Furth, J., 518 Furuta, W. J., 362, 364, 365

G

Gad, I., 594, 605, 606 Gaddum, J. H., 606 Gaebler, O. H., 207, 301 Gaffron, H., 19, 276, 398, 411 Gagnon, J., 365 Gahan, J. B., 540 Galat, A., 145 Gale, E. F., 19, 20, 55, 56, 57, 124, 252, 253, 385, 495, 496 Gall, E. C., 144 Gall, L. S., 308 Gallagher, T. F., 162, 351 Gammeltoft, A., 210 Gard, S., 576, 586 Garden, B. P., 491 Gardner, J., 284 Gards, S., 583 Garnjobst, L., 390 Garvin, J. A., 144

Garzuly-Janke. R., 437. 441 Gast, J. H., 233, 264 Gatsanyuk, M. D., 221 Gaudry, R., 145 Gaunt, W. E., 611 Gautier, C., 49 Gautrelet, J., 109 Gavett, E., 367 Geiger, E., 496 Geiger, W. B., 14, 375, 376 Gene. R., 418 Genest, P., 53 Genevois, L., 420 Genghof, D. S., 498 Genter, W., 24, 50, 51 Gerber, J. M., 526 Germek, O. A., 282 Gerould, C. H., 370 Gersdorff, W. A., 546, 552, 558 Gersh. I., 367 Gettner, H. H., 526 Geyer, R. P., 225, 230, 300 Gherardi, G., 494 Ghesler, A., 205 Ghosh, S. M., 543 Giacomello, G., 162 Gibson, J. A., Jr., 365 Gibson, R. B., 239 Gilberg, H., 305 Gilbert, G. A., 128 Gilda, J. E., 367 Gilder, H., 379, 493 Gillam, A. E., 542, 543 Gillam, W. S., 317 Gillespie, J. M., 457 Gillespie, M., 259 Gililland, J. R., 488 Gilmore, E. L., 516 Ginger, L. G., 103 Gingrich, W., 380 Ginn, J. T., 365, 367 Giovannozzi, M., 465 Giroud, A., 230 Glass, E. H., 550 Glasson, B., 44 Gleim, E., 330 Glick, D., 63 Glikina, V. L., 103 Glock, G. E., 361, 365 Glomset, D. A., 110 Glynn, L. E., 263 Gnadinger, C. B., 544 Goddard, D. R., 421, 422, 423, 426, 430 Goddard, V. R., 331 Godfrey, G. H., 559

Goebel, W. F., 509, 521, Goetchius, G. R., 279 Goetze, H., 594 Goffart, M., 608 Göksu, V., 36, 132 Goldberg, A. A., 210 Goldberg, S. C., 123 Goldfarb, S. R., 265 Goldféder, A., 66 Goldman, A., 25 Goldman, H. M., 366 Goldner, M. G., 204, 205, 206, 240 Goldsmith, E. D., 352 Goldwater, W. H., 119, 123, 124, 126, 146 Golla, Y. M. L., 112 Gomori, G., 61, 204, 205, 206, 220, 362 Goodale, R. S., 328 Goodhue, L. D., 545, 560 Goodloe, M. B., 143 Goodpasture, E. W., 525 Goodwin, D., 47 Goodwin, T. W., 275 Gordon, A. H., 126, 255 Gordon, A. S., 352 Gordon, C. G., 130 Gordon, H., 449 Gordon, L., 324 Gordon, W. G., 144 Gormsen, H., 517 Gortner, R. A., Jr., 135, 296. 364 Gortner, W. A., 108, 112, 219, 221 Gothard, N. J., 560 Gottlieb, B., 362, 369 Gottschalk, A., 199, 441, 446, 453 Gould, B. S., 228 Gould, I. A., 224 Govan, A. D. T., 227 Govier, W. M., 454 Gpepfert, G. T., 448 Grabar, P., 509, 514, 528 Graff, S., 124 Graff-Baker, C., 83 Graham, B. E., 593 Granados, H., 231, 287, 366 Grand, G., 47 Grand, L., 492, 493 Granick, S., 378, 493 Grau, G. R., 263, 308 Grauer, H., 5, 261 Graves, H. C. H., 304 Gray, C. H., 212, 240, 390

Gray, J. S., 53 Gray, P. P., 436 Green, A. A., 48, 82, 121, 445, 458, 555, 565 Green, A. G., 544 Green, D. E., 2, 5, 6, 19, 21, 22, 59, 85, 254, 262, 301, 435, 443, 449, 457, 496, 596 Green, L. F., 426 Greenberg, D. M., 35, 44, 223, 275 Greenberg, L. A., 220 Greenberg, L. D., 289 Greene, R. D., 123 Greengard, H., 354 Greenhut, I. T., 291 Greenstein, J. P., 1, 48, 133 Greenwood, E. K., 320 Gregory, F. G., 417 Greib, E., 382 Greig, M. E., 12 Greiner, H., 527 Greisen, E. C., 481, 494 Griese, A., 447 Griffith, C. F., 159 Griffith, R. B., 409 Griffiths, W. J., 289 Grimm, E., 516 Grinstein, J., 364 Griswold, R. M., 324 Gronwall, A., 122, 518, 524 Groseff, W., 107, 108 Gross, M., 526 Gross, P., 366 Grossberg, A. M., 527, 528 Grossberg, A. L., 511 Grossfeld, J., 109, 444 Grossman, C. M., 263 Grossman, M. I., 354 Grossowicz, N., 481 Grussner, A., 279 Gue, I., 315 Guerrant, N. B., 288, 313, 315, 330, 365 Guetzkov, H., 212 Guggenberg, N., 327 Guggenheim, K., 285, 286, 493 Guggenheim, M., 603 Gugnomi, S., 464 Guirard, B. M., 383, 384, 386 Gunness, M., 123, 294, 376, 377

Gunsalus, I. C., 20, 22, 55, 56, 57, 58, 59, 124, 252, 253, 254, 278, 385, 386, 388, 391, 481, 489, 490, 494, 495, 496 Gunter, J. M., 63, 65 Gunther, F. A., 548 Gunther, G., 422 Gurdjian, E. S., 25 Gurin, S., 16, 24, 196, 197, 235, 259, 488 Gurney, R., 437 Gustafson, F. G., 421 Gustavson, R. G., 352 Guthrie, E. S., 277 Guthrie, J. E., 558 Gutman, A. B., 463, 509. 511 Gutman, E. B., 363 Gutmann, M., 127 Gutowska, M. S., 53 György, P., 226, 257, 276, 376, 377 Gyrisko, G. G., 555

Haag, E., 455 Haas, G. J., 278, 383 Haas, V., 478, 485 Hac, L. R., 123 Hadley, C. H., 555 Haehn, H., 448, 456 Hagedorn, D., 281 Hagedorn, D. R., 282 Hagenguth, K., 585 Hague, E., 377 Haines, W. J., 257 Haist, R. E., 353 Halbert, S. P., 515 Haldi, J., 112, 212, 221 Hale, F., 123 Hale, J. H., 500 Hale, M. G., 41 Haley-Mason, J., 352 Hall, C. E., 348 Hall, R. P., 390 Hall, R. S., 290 Hall, S. R., 347 Haller, H. L., 545, 553, 560, 566 Hallman, L. F., 225, 226 Halpern, G. R., 108 Halverstadt, I. F., 377 Hamilton, H. L., 310 Hamilton, P. B., 259 Hamilton, T. S., 112, 281, 283, 284, 385 Hammond, M. M., 307 Hamner, K. C., 323, 324 Hamoir, G., 125

Handler, P., 211 Hanes, C. S., 81, 82, 85, Hanger, F. M., 518 Hanley, B. J., 297 Hansberry R., 539, 540, 541, 549 Hansen, A. E., 110 Hansen, J. W. 551 Hansen, R. G., 233 Hanson, H. T., 113 Happold, F. C., 600 Hardegger, E., 178, 179 Harden, A., 438, 439 Harder, R., 225 Hardin, G., 408 Hardin, H. B., 460 Hardwick, S. W., 283 Hardy, R. A., 125 Hare, K., 351 Hare, M. L. C., 593 Hare, R. S., 351 Hargreaves, C. C. 177 Harington, C. R., 36, 126, 145, 352 Harper, R. H., 323 Harper, S. H., 544, 545 Harrer, C. J., 426, 427 Harris, A., 510, 512, 513, 514, 518 Harris, C. C., 304 Harris, D. G., 408 Harris, H. H., 548 Harris, L. J., 424, 426 Harris, M. E., 321 Harris, P. L., 224, 231, 287 Harris, P. N., 206 Harris, R. H., 122 Harris, R. S., 225 Harris, S. A., 279, 384 Harris, S. C., 329 Harris, T. N., 516 Hart, E. B., 225, 230, 251, 280, 295, 309, 332 Harte, R. A., 36, 520 Hartmann, J., 77 Hartree, E. F., 2, 426 Hartt, C. E., 87 Hartung, W. H., 593, 607 Hartwell, J. L., 523 Hartwig, S., 584 Hartzell, A., 549, 562, 566 Hartzler, E. R., 322 Harvey, E. H., 331 Harvill, E. K., 543, 552, 566 Hasse, K., 423 Hasselbrocke, W. B., 47

Hassid, W. Z., 50, 76, 80, 81, 82, 85, 87, 89, 202, 418, 420, 441, 450, 482, 497, 498, 525 Hastings, A. B., 24 Hastings, N., 305 Hattori, Z., 159 Haugaard, N., 14, 26, 66 Haugen, G. E., 296 Haupt, W., 167 Haurowitz, F., 36, 130, 132, 506, 514 Hausmann, E., 157 Hawkins, R. D., 63, 65 Hawkins, W. B., 212, 251 Haworth, R. D., 184 Haworth, W. N., 50, 76, 77, 79, 81, 82, 83, 84, 89, 202, 441 Hawthorne, J. R., 110 Hay, A. L., 263 Hay, E., 348, 349, 350 Hayes, R. A., 553 Haynes, F. W., 355 Heard, C. R. C., 419, 420 Heard, R. D. H., 595 Heath, R. L., 79, 82, 441 Heegaard, E., 421 Heegaard, E. V., 594, 595 Hegedus, A., 527 Hegsted, D. M., 145, 263, 288, 291, 307 Hehre, E. J., 90, 498, 522 Heide, A., 516, 525 Heidelberger, M., 131, 142, 249, 250, 506, 507, 508, 509, 510, 511, 519, 527 Heiduschka, A., 180 Heino, E. K., 440 Heinzelman, D. C., 97, 98 Heirman, P., 597, 598, 608 Heise, R., 598, 604, 607 Hellbach, R., 144 Helve, O., 206 Henderson, C., 297 Henderson, J. H. M., 428 Henderson, J. L., 94, 226 Henderson, L. M., 289 Hendricks, S. B., 409 Hengstenberg, J., 373 Henig, E., 286 Henle, G., 577, 582 Henle, W., 577, 578, 582 Hennig, G. G., 507

Henriksen, E., 607 Henry, J., 54, 279 Henry, J. P., 514 Henry, K. M., 230 Henry, M., 26 Henry, T. A., 155, 180, 181, 182, 183 Henschel, A., 298 Henseleit, K., 258, 262 Herbert, D., 19, 60, 449, 497 Herbst, E. J., 285 Herbst, R. M., 247 Herman, H., 601 Hernández, A., 35, 67 Herner, B., 5 Herring, V. V., 348 Herrington, B. L., 319 Herrlinger F., 2 Herrmann, R., 182 Hers, H. G., 210 Herschberg, A. D., 66 Hershey, A. D., 527, 528 Hershman, B., 62 Hertz, R., 292 Herzfeld, K. F., 19 Hess, H., 109 Hess, H. V., 158 Hess, O. D., 554 Hesse, H., 442 Hesselbach, M. L., 226 Hester, K. H. C., 544, 560 Hestrin, S., 52, 89, 90, 203, 467, 499 Heumuller, E., 460, 461 Heuser, G. F., 294, 385, 386, 388 Heusser, H., 161, 178, 179 Hevesy, G., 436 Hey, G. L., 556 Heyl, D., 384 Hickey, R. J., 310 Hickey, R. T., 448 Hickman, K., 287 Hidy, P. H., 49, 85, 202 Hilbert, G. E., 76, 77, 79 Hilditch, T. P., 97, 98, 99, 101, 102, 106, 107, 224 Hill, D., 603 Hill, D. L., 4 Hill, R., 402, 406, 425 Hilleman, M. R., 525 Hiltz, M. C., 331 Himes, H. W., 318, 385 Himsworth, H. P., 263 Himwich, H. E., 2: Himwich, W. A., 212 212

Hindemith, H., 220, 234 Hinds, E. C., 369 Hinman, W. F., 330 Hinshaw, H. E., 221 Hinton, T., 584 Hipp, N. J., 144 Hirsch, D., 515, 530 Hirsch, E, F., 219 Hirst, E. L., 89 Hirst, G. K., 577, 581, 587 Hitchings, G. H., 388, 598, 600 Hixon, R. M., 79, 80 Hixson, A. N., 102 Hoag, E. H., 318, 380 Hoagland, C. L., 379 Hoar, W. S., 326 Hobby, G. L., 507 Hoch, H., 141 Hochberg, M., 281, 282, 312, 314, 315, 318, 385 Hockenhull, D. J. D., 60, 497 Hodge, H. C., 367 Hodgson, R., 499 Hodson, A. Z., 325 Hoehn, W. M., 483 Hoerr, C. W., 102 Hoffman, E. J., 332 Hoffman, M. M., 364 Hoffmann, J., 437 Hofmann, A., 175 Hofmann, E., 446, 462 Hofmann, K., 279, 280, 291, 318, 377 Hofstatter, L., 110, 211 Hofstetter, H., 458 Hogan, A. G., 292, 309 Hogberg, B., 455, 458 Hogeboom, G. H., 596, 608 Hohl, L. A., 455 Holleander, A., 580 Holler, H. L., 545 Holliday, E. G., 330 Hollinger, M. E., 329 Hollinshead, W. H., 65 Holman, H. J., 549 Holman, R., 227 Holman, R. T., 9, 98, 104, 108 Holmberg, B., 145 Holmberg, C. G., 41, 518 Holmes, A. D., 320, 323, Holmes, B. E., 588 Holt, A. S., 402, 403 Holt, L. E., Jr., 157, 256, 257

5

85

63

Holtz, P., 257, 598, 601, 604, 607 Homburger, E., 212 Hongo, M., 465 Hooker, S. B., 512 Hoover, S. R., 491 Hopkins, F. G., 10, 426 Hopkins, R. H., 446 Hora, F. B., 423 Horn, K., 447 Horn, M. J., 124 Horowitz, N. H., 294, 362, 377, 421 Horsfall, F. L., 582 Horvath, S. M., 211 Horwitt, M. K., 37 Hotchkiss, N., 555 Hottle, G. A., 386 Houghton, J. A., 127 Houlahan, M. B., 294, 378 Hourigan, C. A., 239, 303 Houssay, A. B., 204, 205 Houssay, B. A., 204, 205, 347, 352, 354 Hove, E. L., 231, 287 Howe, E. E., 145 Howe, P. K., 368 Howitt, F. O., 132 Hoyrup, M., 135 Hrenoff, A. K., 551 Hrubetz, M. C., 297 Hsieh, K. M., 426 Hsueh, T. Y., 480 Huber, C., 494 Huber, W., 275 Hucker, G. J., 382 Hudack, S. S., 516 Huddleson, I. F., 505, 520 Hudson, B. L., 296 Hudson, C. S., 446, 497 Huff, J. W., 283 Huffaker, C. B., 566 Huffman, C. F., 290 Hugel, R., 227 Huggins, C., 27 Hughes, E. B., 332 Hughes, H. B., 483 Hull, R., 131, 142 Hultquist, M. E., 280, 387 Humel, E. J., Jr., 239 Humel, F. J., Jr., 209 Hummel, J. P., 227 Humphreys, E. M., 263 Humphreys, S., 306 Hundley, J. M., 288 Hungate, R. E., 490 Hunter, A., 42, 262

Hunter, F. E., 220, 236 Hunter, G., 313 Hunter, G. J. E., 479 Hunter, G. L., 309 Hunter, M. O., 110, 219 Hunter, R. E., 15 Hunter, R. F., 274, 275 Hunziker, F., 166 Hurst, H., 12, 562, 563. 565 Husemann, E., 82 Hussein, A. A., 425 Huszák, S., 426 Hutchings, B. L., 280, 385, 387 Hutchinson, M., 514 Hutchinson, M. C., 127 Hutner, S. H., 523 Hutt, F. B., 321 Hwang, S. L., 549

Ichniowski, C. T., 598, 604 Ikawa, M., 511, 527, 528, 549 Ikeda, C., 511, 527, 528 Illanes, G., 351 Ingle, D. J., 206, 207, 210, 353, 354 Inglis, J. H., 364 Irby, V., 157, 256 Irish, O. J., 248 Irving, G. W., Jr., 35, 122, 142 Irving, J. T., 364, 365, 366 Irwin, J. O., 353 Isbell, H. S., 446, 448 Iselin, B., 262 Ivanov, L., 451 Ivanov, N. N., 463 Ivanov, S. M., 202 Ivanov, V. I., 49, 86 Ivanovics, G., 381 Ives, M., 328, 330 Ivy, A. C., 354 Iwasaki, T., 161 Izzo, R. A., 110

Jack, E. L., 94, 226 Jackson, K. E., 541 Jackson, R. W., 144 Jackson, S. H., 325 Jacobs, F. A., 353 Jacobs, H. R., 515 Jacobs, W. A., 167, 186, 187

Jacobsen, E., 594, 605, 606 Jacobsen, R. P., 171 Jadassohn, W., 529 James, A. L., 418 James, G. M., 420, 421 James, L. H., 370 James, W. O., 419, 420, 421, 422, 423 James, R. G., 206 Janeway, C. A., 514, 518 Janicaud, J., 103 Jansen, E. F., 63, 128 Jasperson, H., 102, 107, 224 Javtz, E., 516 Jay, P., 369 Jeanloz, R., 441 Jeener, R., 201 Jefferies, H. S., 210 Jefferson, M. E., 105 Jeffery, G. M., 554 Jeffrey, R. N., 409 Jenkins, G. V., 352 Jenks, G., 401 Jennen, R. G., 238 Jenness, R., 325 Jensen, H., 125, 350 Joannon, P., 515 Jodka, J. F. T., 555 Johansen, G., 382 Johansson, E. G., 367 John, H. M., 13, 24, 265 Johns, C. O., 122 Johnson, B. C., 281, 283, 284, 317, 379, 385 Johnson, C. A., 518 Johnson, F. H., 494 Johnson, J., 453 Johnson, J. E., 257 Johnson, M., 122 Johnson, M. J., 477, 480 Johnson, M. L., 282, 299 Johnson, O. H., 278, 383 Johnson, R. E., 281, 297, 299, 315 Johnson, S., 508 Johnson, S. W., 424, 427 Johnson, W. H., 390 Johnston, C., 211, 234, 274 Johnston, C. H., 302 Johnston, E. S., 398, 401, 402, 403, 406 Johnston, J. P., 130 Johnston, W. W., 60 Jolliffe, N., 297 Jones, C. P., 320, 323, 325 Jones, D. A., 436

Jones, D. B., 122, 124 Jones, E. S., 305 Jones, F. T., 120, 135 Jones, H. A., 545, 547, 553, 558, 560 Jones, J. H., 304, 309 Jones, J. I. M., 311 Jones, J. M., 111 Jones, L. R., 515 Jones, M. A., 546 Jones, R. N., 144 Jones, S. G. E., 350 Jones, T. C., 306 Joost, E., 442 Jordan, C., 440 Jordan Lloyd D., 134, 135 Jorpes, E., 520 Joslin, E. P., 206 Joslyn, M. A., 435, 441, 455 Jucker, E., 274 Junowicz-Kocholaty, R., 439 Just, F., 437, 444 Kabat, E. A., 505, 506. 507, 508, 509, 510, 511. 512, 513, 514, 515, 518, 519, 521, 522, 523, 524, 526, 527 Kabelitz, G., 228, 234 Kaeser, H. E., 302 Kauffmann, F., 521 Kaufman, D., 140, 141 Kaufmann, H. P., 94, 100 Kaufmann, O. W., 224 Kagan, B. O., 397 Kagy, G. F., 551 Kahler, H., 574 Kaiser, H., 508, 509, 510, 511, 521 Kalckar, H. M., 50, 51, 52, 202, 450, 458, 459 Kalman, A., 347 Kalnitski, G., 9 Kalnitsky, G., 17, 478, 487 Kamen, M. D., 477, 478, 485 Kamin, H., 315 Kamlet, J., 464 Kanbe, J., 429 Kang, K. J., 186 Kao, Y. S., 186 Kapeller-Adler, 6

Kaplan, N., 87, 482

Kaplan, N. O., 25, 198, 206, 223 Karczag, L., 459 Karrer, P., 203, 274, 276, 601 Karrer, W., 174, 175 Karshan, M., 370 Kartin, B. L., 110, 227 Kascher, H. M., 316 Kaser, M. M., 256, 288 Kass, E. H., 205, 517 Kass, J. P., 95 Kassell, B., 119, 123, 124, 126 Kassanis, B., 582 Kasten, E., 446 Kattus, A. A., Jr., 251 Katz, A., 165, 171, 172 Katz, E., 398, 400, 405, 407, 410 Katz, J. R., 77, 78, 134, 136, 137 Katzin, E. M., 516 Katznelson, H., 489 Kaucher, M., 110, 223 Kausche, G. A., 584 Kautsky, H., 403, 404 Kaye, M. A. G., 144 Kazakov, K., 444 Kazal, L. A., 483 Kearns, C. W., 564 Keenan, G. L., 352 Keilin, D., 2, 4, 122, 426, 599, 610 Keil, W., 234 Keith, C. K., 5 Keller, A. D., 209 Keller, J. M., 258 Kelly, J. T., 326 Kelsey, F. D., 240 Kemmerer, A. R., 274, 302, 322 Kempster, H. L., 292, 309 Kench, T. E., 443 Kendall, F. E., 206, 527 Kendrick, S. G., 327 Kennedy, C., 291 Kepler, E. J., 354 Keppel, D. M., 264 Keresztesy, J. C., 387 Kerly, M., 423 Kerr, R. W., 76, 78, 79, 80, 201 Kertesz, Z. I., 328, 426 Kesel, R. G., 370 Kesten, H. D., 308 Keston, A. S., 247, 263 Keyes, P. H., 367 Keys, A., 212, 298, 314

Kibler, A., 299 Kidd, F., 418, 430 Kidd, J. G., 515, 519 Kidder, G. W., 386, 387, 390 Kiels, M. W., 9 Kiene, E., 436 Kiermeier, F., 2 Kiese, M., 53 Kiessling, W., 439, 450 Kilmer, G. W., 553 Kimball, C. P., 250 King, C. G., 230, 287, 426, 427 King, H. K., 525 King, H. L., 551 King, H. R., 519, 520 Kintoff, W., 456 Kirby, A. H. M., 141 Kirch, E. R., 370 Kirsch, P., 100 Kirschbaum, A., 204, 226 Kisch, B., 596 Kiselev, A. V., 95 Kiseleva, V. V., 95 Kitasato, T., 460 Kitchen, H., 84 Kium, T. P., 492 Kiun, T. P., 47 Kjerulf-Jensen, K., 199, 201, 210 Klammerth, O., 455 Kleczkowski, A., 505, 512, 575 Klein, B. V., 197, 225 Klein, J. R., 25 Klein, M., 293, 581 Kleiner, I. S., 42 Kleinzeller, A., 225, 456 Klendshoj, N. C., 519, 520 Klemperer, F .. Klemperer, F. W., 9 Klevens, H. B., 99 Kligler, I. J., 285, 286, 587 Kline, B. S., 350 Kline, O. L., 305 Kline, R. F., 212 Kluyver, A. J., 451, 467. 476, 494 Knaysi, G., 475 Kneen, E., 61, 497 Knight, B. C. J. G., 375, 376, 383, 386, 579 Knight, C. A., 509, 511, 574, 577, 578, 580, 581 Knight, H. B., 103 Knipling, E. F., 544, 553, 554, 558, 560

6,

4.

2,

27

79.

26

4

Knipschildt, H. E., 521 Knoth, C. B., 200, 239 Knoll, W., 446 Knouff, R. A., 110, 219 Knowles, V. H. 285 Knowles, W. S., 178 Knowlton, K., 207 Knox, R., 11, 494 Knox, W. E., 19, 443, 463 Knutson, J. W., 368 Kobayashi, C., 459 Kobel, M., 420 Koberle, F., 226 Koch, H. P., 104 Kochakian, C. D., 43 Kodicek, E., 229, 326 Koehne, M., 361 Koenig, V. L., 352 Koepsell, H. J., 477, 480 Kofler, M., 313 Kogl, F., 259, 260, 261 Kohn, H. I., 594 Koller, F., 203 Kolthoff, I. M., 412 Kon, S. K., 320 Kondritzer, A. A., 143 Konikova, A. S., 497 Kopeloff, L. M., 515 Kopeloff, N., 515 Kopp, L. J., 207, 253, 254 Koppanyi, T., 277 Korkes, S., 422 Kornberg, A., 290 Kosa, Y., 11 Koser, S. A., 379, 483 Koss, W. F., 367 Kosterlitz, H. W., 450, 466 Kostoff, D., 541 Kountz, N. B., 211 Kountz, W. B., 110 Kovács, T., 66 Kozmina, N. P., 41 Kraemer, E. A., 105 Krainick, H. G., 219 Kramer, B., 280, 312 Krampitz, L. O., 17, 19. 239, 478 Kratzer, F. H., 308 Krauel, K. K., 239 Kraus, J., 164, 166, 257 Kraut, H., 227 Kraybill, H. R., 95, 96 Krebs, H. A., 15, 235, 258, 262, 427, 594 Kreeger, F. B., 105 Krehl, W. A., 292, 306,

307, 332, 379

Kreiger, J., 275 Kreis, W., 164, 166 Kreitmair, H., 176 Krejci, L. E., 142, 523 Kreke, C. W., 1, 3, 465 Kreps, E. M., 53 Kreshover, S. J., 367 Krestin, D., 300 Krimsky, I., 278 Krishnaswami, R., 607 Kritsman, M. G., 21, 23, 255 Kriukova, N., 87 Kroner, W., 426 Krueger, J., 156 Krueger, K., 319, 388 Kruhoffer, P., 210 Krukovsky, V. N., 277 Krumey, F., 459, 460, 461 Kruse, H. D., 297 Kubowitz, F., 19, 52, 67, 424, 426, 599, 608 Kuck, J. A., 178 Kuether, C. A., 366 Kugler, A., 276 Kuh, E., 280, 387 Kuhn, R., 381, 382 Kuhn, W., 260 Kuiken, K. A., 123 Kuizenga, M. H., 206, 353, 354 Kuk-Meiri, S., 38 Kulka, A. M., 515, 530 Kulka, J. P., 251 Kumler, W. O., 164 Kumm, J., 402 Kunitz, M., 42, 121, 199 Kursanov, A., 87 Kussner, W., 166, 176 Kuyper, A. C., 363 Kuzin, A. M., 49, 86, 145, 202 Kwiatkowski, S., 606 Kyhos, E. D., 281, 282, 301

Lackey, R. W., 211, 239 Lad, D. T., 403, 410 Ladd, D. T., 18 LaForge, F. B., 542, 543, 560, 566

LaForge, F. B., 542, 543, 560, 566 Laidlaw, P. P., 603 Laipply, T. C., 516 Laitinen, H. A., 412 Laki, E., 67 Laki, K., 46, 67 Lambou, M. G., 100 Lamfrom, H., 294 Lampen, J. O., 292, 377, 386, 387, 457 Lampitt, L. H., 4, 323, 427 Lan, T. H., 27, 256 Lancefield, R. C., 505, 523 Lande, K. E., 207 Landgrebe, F. W., 351 Landow, H., 511, 518 Landwehr, G., 299 Lang, K., 11 Lang, W., 156, 157, 158, 159 Lange, W. H., 559 Langemann, H., 63, 65 Langerbeck, A., 163 Langwill, K. E., 287 Lankford, C. E., 383 Lansteiner, K., 143, 505, 515, 520, 528, 530 Lardon, A., 177 Lardy, H. A., 15, 23, 24, 51, 194, 196, 200, 233, 398, 411, 436 Lariviere, M., 350 Larsen, A., 385, 387, 492, 496 Larsen, V., 606 Lasater, T. E., 291 Laser, H., 27 Laskowski, M., 5, 6, 280 Laszlo, D., 291 Latker, S. N., 397 Lauer, W. M., 104 Lauffer, M. A., 573, 577, 578, 579, 581, 583 Lauger, P., 553, 555, 563 Lavietes, P. H., 263 Lavin, G. I., 42, 522, 582 Lawrason, F. D., 226 Lawrence, A. S. C., 461 Lawrence, C. A., 279 Lawrence, U. M., 319 Lawrence, W. E., 209 Lawrence, W. S., 611 Lawrenz, M., 364 Lazansky, J. P., 367 Lea, D., 588 Leach, W. 412 Leake, C. D., 551 Leathem, J. H., 356 Lebedew, A., 87 Leblond, C. P., 349 Le Breton, E., 62 Lechner, R., 444, 448 Lecouq, R., 304 Lee, C., 549 Lee, F. A., 313, 328

Lee, M. H., 603 Leech, R. S., 203, 206 Lees, T. M., 448 Lehmann, H., 446 Lehninger. A. L., 16, 124, 196, 228, 236 Leibowitz, J., 52, 203, 438, 467 Leichter, H., 458 Leidy, G., 508 Leiner, M., 53 Leites, S. M., 219 Leloir, L. F., 15, 21, 22, 59, 220, 234, 236, 254 Lemaire, A., 610 Lemley, J. M., 5 Lemon, H. W., 99 Leonard, O. A., 87 Leonian, L. H., 319, 376, 377, 391 Leopold, H., 61 Lepage, G. A., 475, 476 Lepkovsky, S., 226, 256, 307, 308 Lernner, E., 315 Leroux, H., 2, 277 Lesher, M., 320 Leshinskaya, C., 465 Lesser, M. A., 408 Lester, D., 220 Leuchtenberger, C., 291 Leuchtenberger, R., 291 Leuthardt, F., 44 Leuthardt, F. M., 1, 48 Levantzeva, N. S., 602 Levin, L., 351 Levine, P., 516 Levine, R., 208 Levinson, A., 331 Levitov, M. N., 438 Levy-Hochman, S., 350 Lewis, C. D., 145 Lewis, C. M., 398, 399, 408, 410 Lewis, J. C., 123, 145, 353 Lewis, J. M., 303 Lewis, K. H., 61, 497 Lewis, L., 206 Lewis, T. H. C., 240 Lewis, W. H., 562 Lewisohn, R., 291 Lewy, R., 451 Leyton, G., 527 Li, C. H., 123, 207, 265, 347, 348, 349, 352 Li, S. Y., 186 Libet, B., 26 Lichstein, H. C., 22, 56, 58, 59, 231, 254, 278,

305, 309, 385, 386, 493, 495, 496 Liddell, H. F., 124 Lie, I., 426 Liebermann, L. 463 Lifson, N., 17, 195, 196, 237, 490 Light, R. F., 363 Lilly, D. M., 390 Lilly, V. G., 319, 376, 391 Lincoln, R., 327 Lindegren, C. C., 309, 391, 445, 466 Lindegren, G., 309, 391, 466 Linderstrom-Land, K., 247 Lindner, M., 388, 389 Lindner, W., 177 Lindquist, A. W., 558, 560 Lindquist, H. G., 320, 325 Lindvall, S., 437 Lineweaver, H., 63, 128 Lingenfelter, J. W. T., Link, K. P., 265, 549 Linton, R. W., 523 Linville, R. G., 178 Lipmann, F., 18, 24, 195, 220, 229, 234, 238, 239, 248, 411, 419, 445, 447, 458, 476, 480, 484, 486, 487, 491 Lissák, K., 66 Little, V. A., 547 Loaeza, F., 35, 67 Lockhart, E. E., 225 Lockwood, L. B., 489 Loeper, J., 610 Loeper, M., 610 Loffler, W., 603 Loginova, L. G., 440 Lohmann, K., 447, 460 Lojkin, M. E., 505, 506 Lominski, I., 500 Long, B., 377 Long, C., 25 Long, C. N. H., 111, 207, 225 Long, W. P., 162 Longenecker, H. E., 94, 95, 105, 106, 224, 230 Longsworth, L. G., 141 Longuet-Higgins, H. C., 130 Looby, J., 370 Loomis, E. C., 122 Loosli, J. F., 232

Loosli, J. K., 304 Lopez, J. A., 314 Lopez Castro, G., 510, 513 Lorber, V., 17, 195, 196, 237, 490 Lord, J. W., 285 Loring, H. S., 386 Louis, L., 208, 350 Loveless, M. H., 529 Lovett-Janison, P. L., 426 Lowell, F. C., 515 Lowman, M. S., 547, 548 Lowry, O. H., 297, 306, Lucas, C. C., 124, 233, 264 Luck, J. M., 35, 133, 141, 143 Luckey, T. D., 280, 295, 318 Ludtke, K., 598, 604, 607 Ludwig, G. L., 554 Ludwig, M. I., 276 Luecke, R. W., 290, 292, 330 Luers, H., 444 Luetscher, J. A., Jr., 119 Lugg, J. W. H., 122 Lum, F. G., 35, 133, 332 Lumbiere, A., 595 Lund, A. P., 363 Lund, H., 515 Lundbaek, K., 210, 233 Lundberg, W. O., 104, 108, 113, 313 Lunde, G., 426 Lundgren, C. E., 443 Lundgren, H. P., 144 Lundin, H., 456 Lundquist, G., 451 Lundquist, N. S., 288 Lundsgaard, E., 210 Luria, S. E., 582 Lustig, B., 143, 265 Lustig, H., 435, 449, 451, 454 Luttgens, W., 19, 401, 406 Lutwak-Mann, C., 63, 423, 457, 594 Lux, A. R., 93 Luzzatti, L., 110 Lwoff, A., 375, 378 Lwoff, M., 378 Lyman, C. M., 123 Lyman, J. F., 325 Lynch, S. J., 322

Lyne, R. R., 89

1

9,

1,

8,

20,

95.

39.

47,

86,

50

506

207,

94,

230

. C.,

41

,

Lynen, F., 437, 456 Lyons, R. N., 14, 46, 287 Lyster, S. C., 353 McAlister, L. C., 553 McAnally, R. A., 220, 238 McArthur, C. S., 227 McBeath, E. C., 368 MacBryde, C. M., 353 McCabe, M. M., 292 McCall, G. L., 551 McCall, K. B., 291, 306, 309 McCall, M., 14 McCance, R. A., 600 McCarter, J. W., 524 McCarthy, J. F., 426 McCasland, G. E., 526 McCauley, H. B., 367 McCay, C. M., 296, 327, 364 McChesney, E. W., 287 McClendon, J. F., 368 McClure, F. J., 369 McConnell, J. E. W., 327 McCoord, A. B., 251 McCoy, R. H., 291 McCready, R. M., 76, 80, 81, 82, 85, 441, 450, 525 McDermott, K., 514, 515 McDonald, M. R., 199 MacDonald, W. C., 515 McElroy, W. D., 25, 482, 494 Macey, A., 50, 81, 82, 83 MacFadyen, D. A., 524 McFarland, M. L., 233 Macfarlane, E. W. E., 516 McFarlane, J. A., 516, Macfarlane, M. G., 420 MacFarlane, R. G., 290 McGovran, E. R., 552, 558, 560, 566 McGuire, E. G., 329 Machado, A. L., 24 Macheboeuf, M. A., 110 McHenry, E. W., 233, 299 Machlis, L., 428, 429 McIlwain, H., 389 McIndoo, V. E., 539, 549 MacInnes, D. A., 142 McIntire, J. M., 123, 289,

367

MacIntosh, F. C., 610

Mack, G. L., 426 McKee, F. W., 212 McKennis, H., Jr., 256 McKibbin, J. M., 288, 308 MacKinney, G., 329, 408 McKinney, H. H., 576 MacLachlan, P. L., 220, 224 McLean, I. W., Jr., 133, 577, 578, 579, 582 MacLeod, C. M., 40, 41 MacLeod, G., 285, 287 McMahan, J. R., 123, 383 McMaster, P. D., 516 McMeekin, T. L., 134, 135, 136, 137, 144 McNair, J. B., 93 McNeil, C., 519 MacPherson, C. F. C., 131, 141, 142, 507, 510, 511 McRary, W. L., 212 McShan, W. H., 25, 350, 356, 518 McVeigh, I., 294, 379 Macy, I. G., 320, 321 Madden, A. H., 558, 560 Madden, S. C., 250, 251, 263 Madinaveitia, J., 293 Maengvyn-Davies, G., 448 Magee, J. L., 399 Magerk, J., 203 Magerlein, B., 553 Maier-Leibnitz, H., 50, 51 Maitland, P., 156 Malafaya, B. A., 602 Malheiro, D. M., 564 Malkiel, S., 506 Mallette, M. F., 602 Malm, M., 437, 440 Malone, P. D., 208 Malone, V., 325 Maltaner, E., 518 Maltaner, F., 518 Man, E. B., 110, 227 Mandel, S., 121 Mann, D. W., 130 Mann, F. G., 352 Mann, P. J. G., 595 Mann, T., 4, 13, 24, 63, 200, 460, 599, 610 Mannich, C., 167, 170, 171 Manning, W. M., 398, 408, 412

Manten, A., 476 Manuel, M. E., 412 Mapson, L. W., 277 Marcovitch, S., 364, 566 Marcuse, R., 437, 457 Mardones, F., 355 Marenzi, A. D., 110, 219 Maritz, A., 262 Markees, S., 233 Markham, R., 588 Marker, R. E., 156, 167 Marks, H. P., 353 Markwood, L. U., 541 Marquardt, P., 597, 608 Marsh, P. B., 423, 430 Marshall, C., 25 Marshall, C. E., 515 Marshall, D. E., 526 Marshall, E. R., 178 Marsters, R. W., 289 Martin, A. J. P., 124, 126, 255 Martin, A. R., 293, 310 Martin, C. J., 105 Martin, D. S., 529 Martin, G. J., 598, 604 Martin, H., 553, 555, 563 Martin, J. T., 544, 546, 560 Mason, H. L., 354 Mason, K. E., 287, 366 Massucci, P., 524 Mata, M., 219 Matsuoka, T., 426 Mattar, E., 208 Matterson, L. D., 239. 303 Matthey. A., 224 Mattil, K. F., 99, 105 Mattill, H. A., 227 Mattis, P. A., 291 Mattson, F., 225 Maurer, F. D., 306 Mawson, C. A., 53 Mawson, E. H., 320 Mayer, A., 76 Mayer, A. M., 312 Mayer, E. L., 540 Mayer, M., 142, 506, 507, 511, 519, 527 Mayfield, H. H., 277 Maynard, J. T., 511, 527, 528 Maynard, L. A., 232, 319, 323 Maze, N., 210 Mazoue, H., 304 Mazza, F. P., 219 Mazzoleni, L., 222

Meara, M. L., 98, 106, 224 Meckel, R. B., 331 Medes, G., 17, 57, 236, 238, 259, 264 Meek, J. S., 477, 480 Meer, K. F., 516 Mehl, J. W., 127, 130, 133 Mehlenbacher, V. C., 100 Meier-Leibnitz, H., 24 Meiklejohn, J., 417 Meiller, F. H., 365 Meinke, W. W., 302, 311, 322 Meister, A., 120 Melass, V. H., 307 Melcher, L. R., 525 Melchers, G., 585 Melik-Sarkisyan, S. S., 255 Melin, M., 514 Melinkov, N. U., 552 Mellanby, H. 361, 365 Mellanby, M., 361, 365 Mellander, O., 142 Mellon, M. G., 95 Melnick, D., 281, 282, 284, 312, 314, 315, 316, 318, 385 Melnick, J. L., 453 Melville, D. B., 376, 377 Melville, E. V., 351 Memelsdorff, I., 25, 198 Mendel, B., 63, 64, 65, 66 Menschikoff, G., 540 Menzel, A. E. O., 522 Merlini, D., 239 Merry, J., 423 Mertens, E., 516 Meserve, E. R., 302, 317 Messart, L., 459 Metcalf, W. S., 317, 554, 564 Metcoff, J., 251 Meybaum, W. W., 212 Meyer, K. H., 49, 76, 79, Meyer, P., 595 Meyer, R. K., 25, 350, 356, 518 Meyer, W., 206 Meyerhof, O., 6, 8, 24, 50, 51, 52, 198, 199, 439, 447, 450, 451 Meystre, C., 180 Michaelis, M., 12 Michaelis, R., 6, 423 Michaud, L., 251 Micheel, F., 447

Mickelson, M. N., 449 Mickelson, O., 212, 283, 298, 314 Miescher, K., 180 Migicovsky, B. B., 311 Milam, D. F., 298, 300 Milhorat, A. T., 281 Miller, A. A., 205 Miller, A. K., 309 Miller, B. F., 370 Miller, C. D., 324, 329 Miller, C. P. 508, 509. 522 Miller, E., 607 Miller, E. C., 256, 307 Miller, E. S., 99 Miller, G. L., 144, 577, 580, 581 Miller, L., 127 Miller, L. L., 251 Miller, P., 524 Miller, R. C., 289, 306 Miller, S., 321 Miller, W. H., 602 Millican, R. C., 221 Mills, M. R., 94 Mills, R. C., 332 Milstone, H., 40 Mims, V., 280, 292, 387 Mirsky, I. A., 40, 206 Mitchell, C. A., 53 Mitchell, H. H., 112, 226, 240, 281, 283, 284, 304, 364, 385 Mitchell, H. K., 388 Mitchell, J. H., Jr., 96 Mitsuyasu, M., 463 Mohamed, M. S., 44 Mohn, J., 519 Mohn, J. F., 520 Moir, D. R., 412 Molander, D., 204 Moldavsky, L. F., 47 Moller, E. F., 381, 382 Mollison, P. I., 519 Mommaerts, W. F. H. M., 46 Monoz, J. M., 228, 234 Montgomery, C. M., 558 Montgomery, M. L., 232, 264, 292 Montigel, C., 163, 206 Moore, C. V., 284 Moore, D. H., 5, 131, 141, 142, 143, 351, 506, 510, 512, 513, 514, 518, 526,609 Moore, E. L., 327 Moore, L. A., 285, 363 Moore, M., 161

Moore, P. E., 297 Moore, P. R., 280 Moore, R. H., 548 Moore, T., 302, 365 Moos, A. M., 506, 507 Morales, M. F., 221 Morehead, R. P., 257 Morehouse, M. G., 211, 234 Morell, S. A., 489 Morgan, A. F., 256, 304, 307, 327, 329, 366 Morgan, C. L., 304 Morgan, E. J., 426, 427 Morgan, H. R., 523 Morgan, W. M., 184 Morgan, W. T. J., 505, 519, 520 Mori, T., 440 Morpeth, E., 66 Morrell, C. A., 326 Morris, C. J. O. R., 141 Morris, H. P., 265 Morris, M. E., 286 Morrison, F. B., 304 Morrison, H. S., 595 Morton, M. C., 611 Morton, R. A., 97, 99, 275 Mosimann, H., 130 Moss, A. R., 258 Mosto, D., 227 Mothes, A. M., 348 Mott, L. O., 557 Moulder, J. W., 7, 17, 22, 195 Mourgue, M., 41, 363 Moutte, M., 130 Movitt, E., 225, 226 Mowat, J. H., 280, 387 Moyer, A. W., 264 Moyer, D., 379 Moyer, E. H., 280 Moyer, E. Z., 110, 223, 329 Mozingo, R., 279 Mudd, S., 54, 277, 515. 524 Mueller, A. J., 251 Mueller, G. C., 104 Mueller, G. P., 553 Mueller, J. H., 379, 524 Mueller, W. S., 325 Muether, R. O., 515 Muhr, A. C., 158 Mulinos, M. G., 604 Mull, J. W., 300 Mull, R. P., 225, 300, 452 Mullen, J. W., 76 Muller, A., 159

6.

H.

32.

31.

06.

13,

Muller, E., 163
Muller, F., 219
Müller, H. O., 579
Müller, O. H., 412
Muller, J., 604
Muller, P., 553, 555, 563
Munch, J. C., 607
Mundell, D. B., 63
Munks, B., 320
Munsell, H. E., 322
Munson, S. C., 564
Muntwyler, O., 543
Murphy, E. F., 323
Murray, M. M., 361, 365
Musfeld, W., 453
Mustard, M. J., 322
Myers, J., 412
Myers, J. E., 398, 401, 402, 403, 406
Myrback, K., 79, 82, 86, 443, 445, 456, 458
Mystkowski, E. M., 280, 427

Nachaeva, A. S., 454 Nachmansohn, D., 13, 24, 63, 64, 65, 265 Nagel, G., 436 Naghski, J., 491 Nagy, E. K., 66 Nahm, H., 155 Najjar, V. A., 290, 307 Narasingarao, M., 106 Nash, H. A., 275 Nath, M. C., 211 National Research Council, 295, 296 Nayar, S. L., 549 Neal, P. A., 557 Needham, D., 461 Needham, J., 461 Needham, T., 446 Negelein, E., 248, 439, 451 Neidig, C. P., 458 Neill, J. M., 498 Neish, A. C., 489 Nelson, A. A., 557 Nelson, E. M., 305 Nelson, J. M., 3, 4, 423, 424, 426, 599 Nelson, J. W., 353 Nelson, W. L., 314, 323 Nesbitt, L. L., 122 Nettleship, A., 516 Neuberg, C., 87, 420, 435, 438, 446, 448, 449, 450. 451, 454, 458, 459, 460, 461, 462, 463, 464, 595 Neuberger, A., 57, 124, 126, 141, 145, 259 Neurath, H., 132, 133, 137, 142, 143, 506, 513 Newbold, R. P., 181, 182, 183, 184, 185 Newell, J. M., 505, 526, 530 Newman, M. S., 167, 170, Nguyen-Van-Thoai., 220 Nicholson, J. T. L., 231 Nickerson, J., 465 Nickerson, W. J., 449 Nielson, K., 349 Nielson, E., 376, 377 Nielson, J. P., 109 Nielson, J. Nielson, 382, 436 Nier, A. O., 412 Niert, A. O., 412 Niethammer, A., 421 Nikol'skii, V. V., 110 Nilsson, R., 456, 464 Nimms, L. F., 25 Niven, C. F., Jr., 380, 382, 383, 386, 387, 479 Noble, I., 329 Nocito, V., 5, 21, 22, 254, 262 262 Noda, L., 259 Noggle, G. R., 292 Nolte, M. C. A., 551 Nord, F. F., 225, 310. 448, 452, 458 Norman, A. G., 490 Norris, E. R., 266 Norris, F. A., 93 Norris, L. C., 294, 324, 385, 386, 388 Norton, L. B., 539, 540, 541, 549 Norval, I. P., 421 Norvold, R. W., 364 Nothdurft, H., 350 350 Northey, E. H., 280, 387 Novelli, A., 46 Nozawa, M., 28, 199 Neuhoff, H., 163 Neumann, W., 176, 177 Nuckolls, J., 361, 369 Nulsson, R., 451 Nutting, G. C., 129, 144 Nyberg, C., 465

^

Oakwood, T. S., 167 Obermeyer, H. G., 288, 289, 312 Oberst, F. W., 594 O'Brien, J. R. P., 290

Ochoa, S., 6, 7, 18, 19, 54, 194, 195, 455, 458 O'Connell R. A., 144 O'Connor, R. T., 97, 98 Odake, S., 440 O'Dell, B. L., 280 O'Donnell, J. F., 370 O'Donnell, W. W., 324 Ofner, R. R., 558 Ogilvie, R. F., 208 O'Grady, M. K., 264 Ogston, A. G., 130, 585 Ohle, H., 461, 462 Ohlmeyer, P., 24, 50, 51 O'Kane, W. C., 550 Okey, R., 113, 164 Okolova, M. A., 110 Okunuki, K., 421 Olafson, P., 304 Olcott, H. S., 123, 144, 145, 353 Oleinik, E., 587 Oliphant, J. W., 579 Oliver-Gonzalez, J., 520 Olliver, M., 424 Olson R. E., 207, 253, 254 Olson, W. J., 61 Oncley, J. L., 119, 133, 443, 514 O'Neal, R., 203, 499 Onslow, M. W., 418 Oparin, A., 87 Orechhof, A. P., 540 Orent-Keiles, E., 311 Organ, J. G., 426 Orias, O., 204, 205 Ornektekin, S., 132 Ornektekin, S .. Orr, L. W., 557 Orten, A. U. 251, 365 Orten. J. M., 251, 255, 258 Oser. B. L., 281, 282, 284, 312, 314, 315, 316, 317, 385 Oster, R. H., 288, 604, 608, 609 Ostergard, R. P., 226 Ott, P., 52, 67, 291 Oudin, J., 514, 528

Pahst, M. L., 354
Pace, D. M., 28
Pace, N., 112, 221
Pack, F. C., 98
Pacsu, E., 76
Pader, M., 316
Page, E. W., 21, 58
Page, I. H., 355

Pages, J., 110 Paige, M. F. C., 155, 156, 158 Paist, W. D., 166, 178, 179, 180 Pal, N. L., 418 Palmer, A. H., 135 Palmer, K. J., 138, 144 Palmer, L. S., 291, 325 Pangborn, M. C., 109, 518 Pantaléon, J., 62 Pany, J., 420 Panyukova, M. A., 103 Pappen, E. M., 211 Pappenheimer, A. 308, 386, 486 Pardee, A. B., 511, 527. 528 Parker, J. R., 555 Parker, M. W., 409 Parkin, E. A., 555, 565 Parkin, J., 89 Parkinson, T. L., 323 Parrish, D. B., 312 Parrod, J., 601, 610 Parsons, H. T., 282, 284, 295. 305 Partridge, S. M., 520 Parvé, E. P. S., 54, 455 Paschkis, K. E., 11, 24 Pat, S., 159 Pataki, J., 178, 179 Patras, M. C., 365 Patrick, H., 304 Patterson, E. G., 308 Patterson, E. K., 111, 224 Paul, H. E., 289 Paul, J. R., 583 Paul, M. F., 289 Paul, W., 260 Pauling, L., 138, 139, 505, 506, 507, 511, 526, 527, 528 Pavcek, P. L., 285 Pearson, P. B., 290, 292, 307, 330 Peat, S., 50, 76, 77, 79, 81, 82, 83, 84, 202, 441 Peck, F. B., 353 Peck, R., 458 Peck, W. M., 111 Pedersen, K. O., 2, 122, 129, 136, 514 Pelkan, K. F., 610 Pence, J. W., 289, 306 Penney, J. R., 276 Perault, R., 382 Periera, R. S., 564 Perkins, R. Z., 208

Perlman, D., 489 Perlman, E., 509, 521 Perlman, L., 327 Perlmann, G. E., 14 141, 220, 234 Perlzweig, W. A., 283, 300 315 Perrault, A., 523 Perry, D. J., 300 Persing, C. O., 551 Perutz, M. F., 138 Peters, G., 550 Peters, J. P., 110, 227. 263, 300 Peters, R. A., 13, 39, 264 Petersen, R. F., 144 Petersen, W. E., 200 Peterson, M. S., 375, 376, 383, 386, 387, 389, 391 Peterson, W. H., 284. 292, 319, 325, 375, 376, 377, 380, 383, 385, 386, 387, 388, 389, 391, 457, 462, 499 Peterson, W. J., 322 Petrow, V. A., 157, 159, 160 Petrzilka, T., 157, 158, 159 Pett. L. B., 426 Pettijohn, O. G., 489 Peynaud, E., 455 Pfaltz, H., 381 Pfankuch, E., 584, 585 Pfaffner, J. J., 280 Phair, J. J., 522 Phillips, H., 134, 135 Phillips, P. A., 200 Phillips, P. H., 51, 233, 288, 309, 367, 436 Phillipson, A. T., 220, 238 Philpot, F. J., 594, 595, 604, 607 Piccard, R. H., 160 Pickett, M. J., 439, 453, 481, 482, 491 Pickles, E. G., 577, 578, 581, 588 Piening, J. R., 280 Pierce, J. G., 386 Pierpont, R. L., 552, 566 Pigman, W. W., 76, 446. 452 Pilgrim, F. J., 280, 291, Pillemer, L., 127, 505, 514, 527 Pine, M. B., 296, 369

Pi

Pi

Pi

P

P

P

P

P

F

F

Piquet, J., 66 Pirie, N. W., 512, 583, 585, 586, 587 Piskur, M. M., 93 Pitman, A. L., 332 Pitt Rivers, R. V., 36, 145, 352; see Rivers, R. V. P. see also Pizzolato, P., 291 Plack, J., 508 Platt, B. S., 297 Platt, J. R., 99 Plattner, P. A., 156, 157, 158, 159, 161, 163, 177, 178, 179, 180 Plaza di los Reves. M., 355 Plentl, A. A., 355 Pletcher, D. E., 450 Podbielniak, W. J., 93 Poe, C. F., 329 Pohl, W., 544 Polgar, A., 274, 275, 302 Polgar, N., 103 Polis, E., 120 Polivka, H., 519 Pollack, M. A., 381, 388, 389 Pollak, M., 403 Pollock, M. R., 11, 494 Polskin, L. J., 280 Polyarkova, O., 145 Popjak, G., 110, 111, 112 Popken, F., 515 Porter, B. A., 555 Porter, T., 302, 324 Potter, C., 552 Potter, J. S., 574 Potter, V. R., 23, 25, 52, 200, 450 Potts, A. M., 351 Powell, R. C., 239 Powell, R. D., 403 Powell, V. H., 369 Powers, W. H., 426-Pozzani, U. C., 53 Prado, J. L., 306 Pramanik, B. N., 454 Pratt, R., 412 Prelog, V., 157, 160, 162, 182, 183, 184, 185, 186 Press, J., 81 Pressler, B., 387 Pressman, D., 505, 510, 511, 526, 527, 528 Price, W. C., 121, 128, Price, W. H., 6, 50, 51,

198, 203, 209, 353, 450

Pringsheim, H., 446

40.

83.

27.

64

29

24

16.

36.

57.

9.

8.

5

3.

0,

5,

3.

8,

6,

1,

5,

Pringsheim, P., 18, 403, Proger. S., 25 Prokesch, C. E., 3 Pryde, T., 440 Pucher, G. W., 427 Puck, T. J., 403, 404, 405, 408 Pugh, C. E. M., 593, 594, 598, 600, 604 Pugsley, L. I., 326 Pulver, R., 435 Purnell, M., 528 Putnam, F. W., 132, 142, 143, 513 Pve. C. R., 108

Quastel, J. H., 26, 593, 594, 595, 604

Questel, D. D., 555

R

Rabald, E., 164, 166 Rabideau, G. S., 402, 409 Rabinowitch, E., 397 Raborg, J., 464
Race, R. R., 516
Racker, E., 278
Radice, J. C., 227
Radlove, S. B., 107 Rae, J. J., 459 Rae, J. J., Rahn, O., 458 Raistrick, H., 6, 423 Rake, G., 509, 522 Rakoff, A. E., 11, 24 Ralston, A. W., 102 Ramasarma, G. B., 426 Ramon, G., 515 Ramsey, T. L., 350 Ran, F. J., 353 Randall, L. O., 598, 600 Rannefeld, A., 204, 206, 279, 384, 385 Rao, M. N., 307 Rao, M. S., 420 Raper, H. S., 595, 597, 598, 599, 600 Raper, R., 184 Rapoport, S., 451 Rapp, G. W., 370, 490 Rapp, R., 438 Raska, S. B., 11 Rath, F., 442 Rathbun, E. N., 112, 221 Ratner, B., 530

Ratner, S., 5, 247, 249, 250, 258, 262, 263, 457, 508 Ratsimamanga, A. R., 230 Rauen, H., 422 Raventos, J., 608 Rawlins, W. A., 555 Rawson, R. W., 352 Ray, S. N., 426 Raymond-Hamet, 608 Reddin, L., Jr., 529 Reed, B. P., 286 Reed, C. I., 286 Reed, G., 361 Reed, R. K., 355 Reichel, L., 456 Reichert, R., 109 Reichstein, T., 159, 162, 163, 165, 166, 171, 175, 177 Reid, D. F., 226 Reid, J. T., 290 Reid, T. S., 144 Reindel, W., 607 Reineke, E. P., 352 Reiner, J. M., 26, 200 Reiner, L., 142 Reinhardt, W. O., 348 Reinhold, J. G., 231 Reiss, M., 112 Reiss, R., 353 Remington, J. H., 251 Remington, R. E., 224 Renz, J., 164, 166, 172, 173 Reschke, C., 77 Restarski, J. S., 364, 367 Rettger, L. F., 483 Reuhl, E., 422 Revo, M. V., 110 Rewald, B., 442 Reznitschenko, M. S., 41 Rhoades, H. E., 465 Rice, E. E., 321 Rice, K. K., 305 Rice, P. L., 566 Rice, R. G., 35, 133 Richards, A. G., Jr., 65, 111, 224, 370, 562 Richards, A. J., 110, 223 Richards, F. J., 420 Richards, M. B., 307 Richardson, C. H., 541 Richardson, E. M., 277 Richardson, H. H. 550, 552 Richardson, J. E., 277 Richardson, L. R., 292,

Richardson, R. A., 54, 279 Richert, D., 353 Richou, R., 515 Richter, C. P., 208, 211, 305 Richter, D., 426, 594 595, 596, 602, 603, 604, 607, 608, 609, 610 Ricketts, H. T., 207, 208, 353 Riddell, C. B., 110 Rideal, E. K., 128 Riemenschneider, R. W., 106 Riggs, B. C., 26, 66 Riggs, S., 14 Riggs, T., 389 Riker, A. J., 499 Riley, J. P., 97, 99, 101 Rimington, C., 443 Rimehart, J. F., 289 Rioseco, M., 355 Rippel, A., 225 Rittenberg, D., 17, 124, 164, 196, 237, 247, 248, 249, 250, 258, 259, 261, 263, 486, 508 Ritzer, J. L., 328 Rivers, R. V. P., 30, 145, 352 Roark, R. C., 540, 541, 546, 547 Robbins, E. B., 177 Robbins, K. C., 518 Robb-Smith, A. H. T., 290 Robertis, E. D., 348 Roberts, D. J., 582 Roberts, E. C., 515 Roberts, I. S., 461 Roberts, R. H., 446 Robertson, G. J., 159 Robertson, R. N., 423 Robeson, C. D., 275 Robinson, A., 320 Robinson, A. D., 331 Robinson, E. S., 3, 424 Robinson, F. A., 381, 388 Robinson, H. E., 321 Robinson, M. E., 600 Robinson, P., 299 Robinson, P. F., 281, 315 Robinson, R., 103 Robinson, W. B., 314, 328 Roblin, R. O., Jr., 377, 386, 387 Robscheit-Robbins, F. S., 251

Roby, T. O., 306 Roche, J., 41, 67, 121, 130, 363 Rochelmeyer, H., 181, 182, 183, 184, 185, 186 Rockland, L. B., 123 Roderuck, C. E., 320 Rodney, G., 526 Roe, J. H. 211, 366 Roginskaya, Ts. Z., 110 Rogosa, M., 379 Rohrmann, E., 167 Rollman, H. A., 234 Rollmann, H. S., 211 Roloff, M., 258 Rome, M. N., 201 Root, C. M., 522 Root, H. F., 210, 240 Root, H. I., 208 Root, M. A., 66 Rose, C. S., 376, 377 Rose, F. L., 293, 310 Rose, H. M., 301, 516 Rose, W. C., 257 Rosen, F., 293, 377 Rosencranz, S., 609 Rosenfeld, B., 457 Rosenheim, O., 126, 157, 160, 255 Rosenmund, H., 165 Rosenthal, C., 15, 235 Rosenthal, O., 26 Rosner, L., 315 Roth, D. A., 101, 103 Roth, L. J., 602 Roth, R., 316 Rothemund, P., 398 Rothen, A., 528, 529 Rothenberg, M. A., 63, 64, 65, 449 Rothler, H., 257 Roughton, F. J. W., 52, 53 Roverstine, E. A., 211 Rowley, E. M., 348 Roy, A., 220 Roy, D. U., 543 Rubbo, S. D., 457 Ruben, S., 411 Rubin, M., 178 Rubin, S. H., 278, 280. 293, 315, 377, 388 Rudloff, H., 479 Rudney, H., 63, 64, 65, Ruegamer, W. R., 251 Ruffin, J. M., 300 Ruh, E. L., 101 Ruhenstroth - Bauer, G., 160

Ruigh, W. L., 155, 160 Rundle, R. E., 77, 78, 79, 80 Runne, E., 366 Runnstrom, J., 437 Rusch, H. P., 104 Ruschig, H., 177 Ruska, H., 584 Ruskin, S. L., 299 Rusoff, I. I., 98, 99 Russell, G. A., 547, 548 Rutschmann, J., 274 Ruzicka, L. 158, 162, 178. 179, 542 Ryan F. J., 119, 123, 124, 126, 293, 353, 381, 389, AAA Rydon, H. N., 124

010

010

01010101

Sabotka, H., 608, 609 Sacks, J., 198 Sagromsky, H., 408 Sagrott, P. E., 76, 77 Saidel, L. J., 119, 123, 124, 126 Sakami, W., 16, 24, 196, 197, 235, 259, 488 Sakov, N. E., 453 Salazar, W., 35, 67 Salcedo, J., Jr., 223, 231, 308 Salter, L. T., 351 Salter, W. T., 352 Saltzman, A. H., 354 Salvestrini H., 351 Samec, M., 76 Sammons, H. G., 61, 229 Sampath, S., 440 Sanders, E., 608 Sanger, F., 57, 124, 125, 126, 144 Sanigar, E. B., 142 Sapirstein, L. A., 355 Sappington, T. S., 263 Sara, I., 205 Sara, J. G., 204 Sarett, H. P., 284, 318, 326, 380, 382, 383, 389 Sargent, F., 299, 315 Sargent, H., 277 Sarma, P. S., 307 Sarnat, B. G., 667 Sartori, L., 67, 121 Satterthwait, A. F., 555 Saunders, J. B., de C. M., 361, 369 Saunders, P. R., 600, 601 Sawyer, C. H., 64, 65 Scanlan, J. T., 103, 104

AUTHOR INDEX

Scarborough, H., 295 Scarisbrick, R., 402 Schaaf, E., 178 Schade, L., 436 Schaffner, A., 459, 460, 461 Schales, O., 212 Schales, S. S., 212 Schaller, K., 500 Scharf, A., 285 Schechter, J. S., 353 Scheel, F., 9 Scheinberg, H., 130 Schenkein, E. L., 515 Scherp, H. W., 479, 509, 521, 522 Scheurich, N., 257 Schick, B., 368 Schiebe, G., 584 Schieltz, N. C., 79 Schiller, G., 234 Schillinger, A., 479 Schindler, J., 582 Schlenk, F., 22, 59, 254, 380, 385, 451 Schlosser, M. E., 294 Schlossmann, H., 594, 595, 597, 598 Schlossmann, M. C., 604 Schluchterer, E., 522 Schmid, O., 456 Schmidt, C. L. A., 45, 257 Schmidt, E. C. H., Jr., Schmidt, G., 25, 62, 459, 585 Schmidt, G. M., 129 Schmidt, L. H., 483 Schmitt, F. O., 574 Schmuck, A. A., 541 Schneemann, H., 63 Schneider, A., 422, 553 Schneider, L. K., 293, 381, 389 Schneyer, L., 494 Schnider, O., 279 Schoch, T. J., 76, 77, 201, 397 Schoene, F. C., 287 Schoenheimer R., 247, 248, 249, 258, 263, 508 Schonberg, K., 443 Schoonover, I. C., 364 Schopf, C., 182 Schour, I., 286, 365 Schramm, G., 505, 506, 584 Schroeder, C. H., 316 Schroeder, H. A., 608

160

79.

78.

89.

23.

96.

231.

229

125.

318.

389

555

M.,

601

104

Schroeder, H. O., 560 Schuck, C., 364 Schuette, H. A., 101, 103 Schuler, W., 9, 607 Schulke, O., 439 Schull, G. M., 376, 377 Schulman, J. H., 220 Schultz. A. S., 385, 452 Schultz, M. O., 426 Schulz, W. 439, 450 Schuman, R. L., 315 Schumann. W., 178 Schuster, P., 447 Schütz, F., 66 Schwaibold, J., 436 Schwarze, W ., 238 Schweigert, B. S., 123, 289, 291, 367 Schwerin, P., 36, 132, 506 Schwert, G. W., 142 Schwimmer, S., 61 Scott, C. C., 206 Scott, G. T., 412 Scott, M. L. 294, 385, 386, 388 Scott, W. W., 112 Scrimshaw, M. W., 321 Scrimshaw, N. S., 321 Scully, N. J., 409 Searles, E. M., 565 Sealock, R. R., 27, 256 Sebrell, W. H., 123, 288, 289, 290, 297, 306 Seebeck, E., 163 Seeger, D. R., 280, 387 Seegers, W. H., 122 Seeler, A. O., 307 Seeley, R. D., 251 Segal, R. B., 458 Seguin, P., 350 Seibert, F. B., 122, 505, 524 Seibt, S., 543 Seiden, G., 205 Seifter, S., 510, 513, 527 Seitz, W., 597 Seligman, A. M., 250 Selye, H., 348, 349 Selzer, L., 436 Semb, J. 280, 387 Sen, P. B., 220 Sen, P. K., 417 Senti, F. R., 129, 144 Serantes, M. E., 220 Sevag, M. G., 54, 277, 279, 505, 518 Severson, G. M., 76, 78 Sevringhaus, E. L., 281, 282, 301, 353

Seybold, A., 409 Shank, R. E., 379 Shankman, S., 123 Shapiro, S. H., 595, 610 Sharp, D. G., 133, 513, 577, 578, 579 Sharp, P. F., 314 Sharpless, G. R., 223 Sharpless, N. E., 557 Shaskan, E., 486 Shaw, J. C., 224, 239, 303 Shaw, J. H., 288, 309. 367 Shaw, T. M., 128, 138 Shear, M. J., 523 Shedlovsky, T., 522 Shekleton, J. F., 145 Shelburne, M., 54, 277 Sheldon, M. P., 367 Shemin, D., 124, 247, 249, 250, 253, 258, 261 Shen, C. C., 66 Shen, S.-C., 461 Shen, T., 426 Shenkin H., 26 Sheppard, R., 206, 210 Sherman, H., 225 Sherman, H. C., 285, 302 Sherman, J. M., 380, 382, 386, 489 Sherwood, M. B., 388 Sherwood, R. M., 307 Shetlar C. L., 325 Shetlar, M. R., 325 Shields, J. B., 281 Shimkin, M. B., 523 Shipley, E. G., 25, 206 Shipley, E. S. 204 Shipley, R. A., 239 Shipley, R. S., 209 Shiramizu, K., 11 Shirozu, Y., 11 Shive, W., 293, 294, 381, 383 Shock, N. W., 289 Shoda, M., 161 Shoenheimer, R., 250 Shorland, F. B., 101, 103, 107, 221 Sholes, M. L., 329 Shoppee, C. W., 155, 175 Short, W. F., 6, 423 Shour, I., 367 Shovelton T., 523 Shtokvish, N. A., 95 Shtokvisn, N. A., 55 Shull, F. W., 251 Sickels, J. P., 280, 387 Siddall, A. C., 300 Siebenmann, C., 522 Siegel, L., 319

Sieger H., 180 Siemers, G. F., 380 Sievers, A. F., 547, 548 Siewert, G., 167, 170, 171 Signer, R. 130 Sigurdsson, B., 574, 581 Sikorski, H., 510, 511, 521 Silber, R. H., 290, 305, 307 Silberman, H., 111, 155 Silberman-Martyncewa, S., 111, 155 Silberstein, H. E., 250 Sillèn, L. G., 82, 86 Silva, S. S., 276 Silverman, M., 463 Simha, R., 133 Simmonds, S., 256, 264 Simmons, S. W., 554, 555 Simola, P. E., 212 Simpson, J. I., 324, 328 Simpson, M. E., 123, 264, 348, 349 Sinclair, R. G., 109, 223 Singal, S. A., 301 Singer, E., 526 Singer, T. P., 11, 12, 198, 228, 240 Singh, B. K., 105 Singher, H. O., 120 Singleton, W. S., 100, 105 Singsen, E. P., 304 Sipe, H. M., 574 Sisler, E., 49, 85, 86, 202 Sizer, E. W., 37 Sizer, I. W., 3 Skaggs, P. K., 383, 384 Skarka, A., 365 Skarzynski, B., 458 Skeggs, H. R., 291, 294, 388, 389 Skinner, J. T., 605, 606 Skrimshire, G. E. H., 6, 423 Slade, H. D., 477, 488 Slade, R., 558 Slade, R. E., 564 Slanetz, C. A., 285 Slattery, M. C., 212 Slein, M. W., 67, 121, 198, 199, 209 Sloot, W. J. T. A. K., 219 Slotin, L., 17, 255 Slotta, K. H., 604 Smadel, J. E., 586 Smalt, M. A., 3 Smelser, G. K., 351

Smiley, K. L., 382, 383 Smith, A. H., 331, 365 Smith, B. G., 350 Smith, C. A. H., 363 Smith, C. R., 540 Smith, C. S., 450 Smith, C. W., 145 Smith, D. C., 288 Smith, D. G., 522 Smith, E. C., 399 Smith, E. L., 518 Smith, E. P., 129 Smith, F. A., 101 Smith, F. R., 388 Smith, G. E., 554 Smith, H. H., 541 Smith, H. W., 550 Smith, J. H. C., 408, 411 Smith, J. M., Jr., 280, 387 Smith, K. M., 588 Smith, K. W., 353 Smith, L. E., 550 Smith, M. C., 322 Smith, M. I., 556, 557 Smith, P. E., 421 Smith, R. E., 221 Smith, S. G., 291 Smith, W., 500 Smitt, N. K., 556 Smolens, J., 515, 518, 524 Smorodintsev, A. A., 515, 525 Smorodintzeff, A. A., see Smorodintsev, A. A. Smythe, C. V., 47, 450 Snell, E. E., 22, 58, 59, 123, 253, 254, 278, 279, 293, 294, 310, 318, 375, 376, 380, 381, 382, 383, 384, 385, 386, 388, 389, 391, 519 Snellman, O., 583 Snyder, F. H., 594 Snyder, H. R., 145 Snyder, J. C., 310 Sobel, A. E., 280, 312, 316 Soble, R., 519 Sognnaes, R. F., 367 Sokal, H. B., 211 Soldner, P. A., 302, 303 Solomon, A. K., 24 Soloway, S., 604, 608 Soltys, A., 184 Somers, G. F., 49, 85, 86, 202, 314, 323, 324, 515, 594 Somogyi, M., 212, 220, 239, 445, 458

Sonnenberg, A., 110, 211

Sorensen, M., 135 Sorensen, S. P. L., 135 Sorkin, E., 159 Sorkin, M., 162, 163 Soskin, S., 208 Souder, W., 364 Soulairac, A., 211 Soule, M. H., 493 Southard, F. D., 355 Southwick P. L., 277 Spath, A., 178 Speck, R. M., 106 Spector, H., 284 Spelman, A. F., 323 Spence, H. Y., 224 Sperber, E., 437, 443, 445 Sperry, W. M., 226 Spiegelman, S., 28, 199, 466 Spies, J. R., 525, 526 Spies, T. D., 300, 301 Spinella, J. R., 331 Spitz, S., 523 Sponsler, O. L., 134, 135, 446 Sprague, K. L., 291 Sprince, H., 264 Spring, F. S., 159, 295, 388, 389 Sprinson, D. B., 492 Sreenivasaya, M., 422 Sreerangachar, N. B., 425 Srinivasan, M., 426, 607 Stace, N. E., 181, 182, 183, 184, 185 Stacey, M., 457, 522 Stadie, W. C., 14, 15, 26, 66, 93, 219 Stafford, Allen & Sons, Ltd., 544 Stahelin, M., 276 Stallberg-Stenhagen, S., 131 Stamberg, O. E., 278, 315, 322, 325 Standfast, A. F. B., 6, 423 Stanger, D. W., 95 Stanier, R. Y., 481, 488, 489 Stanley, W. M., 144, 510, 511, 578, 579, 580, 581 Stanley, W. W., 364, 566 Stannard, J. N., 28 Stansly, P. G., 294 Starbanow, M. P., 61 Stare, F. J., 209, 251, 263, 288, 291, 308

Stark, I. E., 239

Si

S

Si

Si

S

S

S

S

S

S

S

S

S

S

S

S

S

S

S

S

S

S

S

S

S

S

S

S

S

0101010101010101010101010101

AUTHOR INDEX

Starke, A. C., Jr., 465 Starkenstein, E., 608 Starling, W. W., 157, Staroselski, P. I., 41 Starr, M. P., 523 Stats, D., 505, 529 Staub, A. M., 509 Staudinger, H., 82, 542, 543 Stauffer, J. F., 401, 406, 411, 412, 428 Stavely, H. E., 159 Steblay, R., 494 Steger, A., 102, 108 Steggerda, F. R., 112 Stehle, R. L., 351 Steiger, M., 166, 177 Stein, G., 366 Stein, H. J., 306 Stein, M. W., 8 Steiner, M., 398 Steiner, P. E., 95 Steinhardt, J., 128 Steinhauser, H., 224, 231 Steinhoff, G., 426 Steinlin, K., 274 Steldt, F. A., 176 Stenhagen, E., 131 Stepanenko, N., 102, 409 Stephan, R. M., 370 Stephenson, M. L., 39, 42 Stern, K. G., 53 Stern, M., 211 Stern, R. M., 313 Stetten, D., Jr., 197, 223, 224, 225, 231, 253, 258, 308 Stetten, M. R., 158 Stevens, D. A., 581 Stevens, F. A., 505 Stevens, H., 525, 526 Stevens, T. O., 158 Stevens, T. S., 184 Stevenson, W. A., 555 Stewart, A. P., Jr., 314 Stewart, C. P., 280 Stewart, H. C., 220 Stewart, W. A., 523 Stewart, W. C., 109, 223 Stier, T. J. B., 28, 426 Stock, C. C., 581 Stocken, L. A., 13 Stoerk, H. C., 66 Stohlman, E. F., 556, 557 Stokes, J. L., 123, 294, 376, 377, 385, 387, 388, 391, 458, 492, 496 Stokinger, H. E., 508,

35

445

199.

135.

295,

B.,

607

182,

26,

ons,

S.,

278,

6,

488.

510.

581

566

251,

Stokstad, E. L. R., 280, 387, 388 Stoll, A., 164, 166, 172, 173, 175 Stolovy, E., 293, 381 Stone, H., 348, 349 Stone, J., 436, 581 Stone, M. W., 559 Stone, W., 424 Stone, W. E., 25 Stoppani, A. O. M., 228 Stosick, A. J., 145 Stott, W., 304 Stotz, E., 15, 210, 212, 314, 328, 329, 426, 427, 464 Strain, H. H., 408 Stran, H. M., 350 Strandskov, F. B., 387 Strauss, E., 464 Stricker, L. A., 97 Strong, F. M., 123, 328, 330, 379, 380, 385 Struyk, A. P., 451 Stuart, H. A., 156 Stuckwisch, C. G., 484 Stumpf, P. K., 2, 6, 8, 85, 403, 443, 480, 496 Sturzinger, H., 203 Stutzel, H., 181, 185, 186 Subbarow, Y., 280, 387 Subramanyan, V., 19, 449 Suffolk, S. F., 611 Sugg, G., 90 Sugg, J. Y., 522 Sugiura, K., 523 Sukhareva, N. D., 552 Sukhov, K. S., 585 Sullivan, C. R., 321 Sullivan, J. H., 296 Sullivan, W. N., 545, 547. 566 Sullmann, H., 227 Sulman, F., 350 Sumner, E., 274 Sumner, J. B., 9, 11, 49, 85, 86, 202, 227, 594 Suntzeff, V., 112 Supplee, C., 308 Sure, B., 290 Surgenor, M. E., 239, 303 Suter, C. M., 145 Suter, M. St. A., 1 Sutherland, E. W., 438 Suthers, A. J., 417 Sutter, H., 423 Sutton, T. S., 302, 303 Suykowski, E. J., 350 Suzuki, U., 440 Svedberg, T., 129, 137

Sveinbjornsson, A., 265 Svensson, H., 139, 140, 514 Swain, G., 293 Swain, M. L., 96 Swanson, C. A., 412 Swanson, M. A., 49, 202 Swanson, P., 519 Swedin, B., 5 Sweeney, L., 142 Swegart, J. E., 287 Swern, D., 103, 104 Swift, H. W., 523 Swingle, S. M., 511, 527, 528 Sydenstricker, V. P., 301 Sykes, G., 6, 423 Synerholm, M. E., 566 Synge, R. L. M., 124, 126, 145, 255 Szent-Gyorgyi, A., 119, 426, 597 Szpilfogel, S., 182, 183, 184, 185, 186

Tabor, H., 290 Tagmann, E., 157, 162 Tagnon, H. J., 353 Tainter, M. L., 611 Tak, J. D., 482 Talbot, N. B., 354 Talmud, D. L., 130 Tam, R. K., 559 Tamija, H., 425, 426 Tanasoglu, P., 514 Tang, P. S., 455, 480 Tanko, B., 420 Tanner, F. W., Jr., 292 Tanret, G., 75 Tarr, R. R., 259 Tattersfield, F., 552 Tatum, E. L., 280, 376. 377, 382, 390, 445, 458 Tauber, H., 421 Taurog, A., 108, 222 Tauson, T. A., 443, 457 Tayeuf, F., 110 Taylor, A. R., 133, 513, 578, 579, 580 Taylor, C. V., 390 Taylor, E., 369 Taylor, E. L., 558 Taylor, E. M., 524 Taylor, E. S., 19, 20, 55, 252, 253, 495, 496 Taylor, H. L., 212, 298 Taylor, J. D., 289 Tchen, P. K., 492 Telford, H. S., 556, 558

Telford, I. R., 287, 366 Teller, E., 138 Templeman, W. G., 417 Teng-Yi, L., 292 Tennant, D. M., 305 Teply, L. J., 291, 306, 307, 318, 332, 379 Tepperman, J., 225 Terry, D. E., 93 Terwoord, D., 403 Thacker, C. W., 220 Thaler, H., 107, 108 Thalheimber, M., 66 Thaning, T., 520 Thannhauser, S. J., 62, 459 Thatcher, F. S., 12 Thayer, S. A., 207, 308, 353, 354 Theophilus, D. R., 278, 325 Theorell, H., 2 Thewlis, J., 361, 365 Thibaudet, G., 313 Thiem, H., 551 Thies, H., 437 Thimann, K. V., 465 Thoal, N., 121 Thomas, I., 367 Thomas, J. M., 315, 320 Thomas, L. E., 124 Thomas, M., 421, 422 Thomas, T. B., 206 Thomassen, L., 370 Thompson, C. R., 304 Thompson, J. F., 330 Thompson, K. W., 356 Thomson, K. J., 515 Thomson, R. H. S., 13 Thorogood, E., 205 Thorp, W. T. S., 289 Thudichum, J. L. W., 255 Thunberg, T., 422 Tice, J. W., 297 Tidwell, H. C., 233, 264 Tikka, J., 440 Tillett, W. S., 40, 515 Tillotson, E. K., 11, 24 Tingey, A. H., 607 Tisdall, F. F., 297 Tiselius, A., 38, 125, 524 Tishler, M., 145, 383 Tislowitz, R., 205 Todd, F., 94 Toennies, G., 264 Toman, J. E. P., 288 Tomarelli, R., 226, 276 Tomcsik, J., 509 Tomiyashu, Y., 463, 464 Tonnelat, J., 399

Torda, C., 240, 265, 276, 348, 610, 611 Torregrosa, V., 520 Torrey, J. van P., 178 Toscano Rico, J., 602 Totter, J. R., 292, 387 Tovarnitskii, V. I., 577 Townes, H. K., 555 Traill, D., 144 Trask, J. D., 583 Travis, B. U., 560 Traz, C., 49 Treadwell, C. R., 233, 264 Treffers, H. P., 249, 505, 506, 508, 509, 514, 522 Treim, G., 601 Tresadern, F. A., 544 Trout, S. A., 430 Trubell, O. R., 79, 80 Tschesche, R., 167 Tuba, J., 313 Tuck, G. M., 389 Tullar, B. F., 145 Tunca, M., 36, 132 Tuohy, E. B., 607, 609 Turfitt, G. E., 164, 482 Turner, A. W., 37 Turner, C. W., 352 Turner, D. L., 267 Turner, F. C., 523 Turner, J. S., 417, 423 Turner, M. L., 351 Turner, R. S., 351 Turrell, F. M., 548 Tutin, F., 181, 184 Tuttle, D. M., 479 Tuttle, L. C., 18, 24, 195, 220, 239, 411, 476, 484 Tyler, A., 514 Tyren, H., 583

Udiljak, M., 285, 302 Uffer, A., 163, 180 Uhle, F. C., 166, 175, 179, 180, 186, 187 Ulshafer, P. R., 167 Umbreit, W. W., 20, 22, 55, 56, 57, 58, 59, 124, 252, 253, 254, 278, 385, 386, 406, 411, 412, 420, 475, 476, 481, 495, 496, 589 Underkofler, L. A., 380, 481, 489

Upholt, W. M., 554 Urbach, E., 212 Urnas, B., 354 Ussing, H. H., 265 Utevsky, A. M., 602 Utter, M. F., 9, 18, 36, 194, 195, 200, 239, 436, 476, 480, 487 Uzman, L., 132, 145

Vaidya, M., 444 Valdiguie, P., 111 Vallières, G., 76 Vanaud, H., 110 van der Burg, A., 494 van der Kirk, G. J. M., 494 van Dorp, D. A., 459 Vandenbelt, J. M., 122 Vandendriessche, L., 459 Van Duyne, F. O., 324, 328 Van Goor, H., 53 Van Heyningen, R., 520 van Itallie, T. B., 77, 78 Van Lanen, J. M., 292 van Loon, J., 102, 108 Van Niel, C. B., 410, 452, 476, 491 van Oettingen, W. F., 557 van Thoai, N., 67 van Veersen, G. J., 260 van Wagtendonk, W. J., 294, 390 Vardar, M., 130 Vassel, B., 122 Vasseur, E., 445 Vaughan, J. R., Jr., 386, 387 Vaughan, S. L., 520 Vaughn, R. H., 488 Vavich, M. G., 288, 313, 315, 330 Vaz, Z., 564 Vedani, L. G., 366 Veingerov, M. L., 412 Veitch, F. P., Jr., 277 Veldman, H., 459 Velick, S. F., 102, 112 Venkatarao, C., 106 Venkatesen, T. R., 422 Venkateswarlu, A., 106 Vennesland, B., 7, 9, 18, 19, 22, 24, 194, 463 Verlin, W. A., 368 Verzar, F., 435 Vialette, G., 41 Vickery, H. B., 121, 427 Victor, J., 206, 308, 507 Villela, G. G., 306 Vinet, A., 607 Vinson, L. J., 310 Visnyei, K., 330

Vivino, A. E., 277 Vogel, H. A., 101 Vogel, P., 516 Vogt, M., 207 Vojnovich, C., 292 Volarovich, N., 102 Volker, J. F., 364, 365, 367 Volkin, E., 513 Vollenweider, H., 529 Vollmer, H., 368 Volz, G. W., 61 von Auwers, K., 462 Von Christiani, A., 164 von Euler, H., 451, 455. 458 von Euw, J., 177 Von Schoor, A., 161 von Soden, O., 442 Vorms, I. A., 95 Vovk, A. M., 585

36.

36,

M.,

2

459

24.

520

78

152,

F.,

50

. J.,

386,

313,

12

22

106 , 18,

63

427

507

2

8

W

Waddell, E., 329 Wade, N. J., 353 Wadley, F. M., 564 Wadsworth, H. I., 328 Waelsch, H., 234, 247 Wagner, J. R., 328 Wagner-Jauregg, T., 422 Wagreich, H., 599 Wain, R. I., 563 Waisbren, B. A., 205 Waisman, H. A., 291, 305, 306, 309 Wakerlin, G. E., 518 Walker, A. C., 45, 257 Walker, B. S., 220 Walker, E. M., 3 Walker, F. T., 94 Walker, T. K., 417 Wall, M. J., 586 Wallenfels, K., 184 Waller, C. W., 280, 387 Waller, P. K., 516 Wallerstein, J. S., 41, 53 Wallin, T., 443 Walsh, T. M., 465 Walter, A. W., 515 Wang, Y. L., 122, 302, 326 Warburg, O., 8, 401, 406, 439, 447, 451 Ward, G. E., 489 Ward, S. M., 379 Ward, W. H., 120, 121 Waring, H., 351 Warner, D. T., 257 Warner, R. C., 120, 122,

134, 135, 136, 137, 142, 144 Warren, C. O., 27 Warrick, F. B., 363 Warshaver, E. R., 520 Wasserman, F., 362, 505 Wassink, E. C., 398, 400, 405, 407, 410 Waters, L. L., 13 Watkins, W. M., 520 Watson, R. F., 523, 524 Weaver, H. M., 305 Webb, E. C., 459 Webster, J. E., 25 Webster, T. A., 259 Weibull, C., 85 Weichselbaum, T. E., 220 Weil, A., 126 Weil, A. J., 505, 507, 508, 515, 516, 521, 529 Weil, K., 260 Weil-Malherbe, H., 235 Weill, C. E., 13, 60 Weinglass, A. R., 204, 353 Weinhouse, S., 17, 219, 236, 238, 259 Weinmann, J. P., 286, 361, 365 Weintraub, R. L., 411 Weir, J. M., 515 Weischer, A., 227 Weisler, L., 276 Weissberger, L. H., 210 Weissweiler, A., 409 Weisz-Tabori, E., 19, 54, 194, 195 Weitkamp, A. W., 102 Weitzel, G., 234 Weizmann, C., 457 Welch, A. D., 284, 291, 294, 375, 376 Welch, E. A., 108, 222 Weldon, V., 322 Weller, R. A., 122 Wells, L. J.. 204 Wels, P., 525 Wendt, G., 440 Wense, T., 602 Werbin, H., 316 Werkman, C. H., 9, 17, 18, 19, 195, 229, 239, 255, 436, 449, 463, 476, 477, 478, 480, 484, 487, 488 Wertheim, M., 79 Wertheimer, E., 204, 211 Wertz, A. W., 325 Wessinger, G. D., 361, 365

Wesson, L. G., 362 West, C., 418 West, T. F., 543, 544, 555, 563 Westenbrink, H. G. K., 459 Westerfeld, W. W., 19, 288, 462, 463, 464 Westerman, B. D., 331 Westphalen, T., 157 Wetzel, K., 421 Weygand, F., 382 Whealley, W., 553 Wheeler, H. H., 304 Whelton, R., 476 Whipple, G. H., 250, 251, 610 Whistler, R. L., 76, 77, 79 Whitcombe, J., 328 White, A., 348, 517, 518 White, E. A., 231 White, G. C., 239 White, H. L., 417 White, J. C., 479 White, J. W., Jr., 491 White, R. L., 368 White, W. H., 555 Whiting, G. C., 423, 424 Whitmore, F. C., 93 Whittam, D., 555 Wicks, L. F., 112 Widdowson, E. M., 419 Wiederhold, E., 327 Wieland, H., 15, 235, 238, 260, 423, 442, 454 Wieland, T., 260, 381 Wiener, A. S., 516, 519 Wiesmann, R., 552, 553 Wiggins, L. F., 159 Wigglesworth, V. B., 557, 563 Wilcox, E. B., 328 Wilcoxon, F., 549 Wilder, R. M., 295, 297 Wilkie, J. B., 316 Wilkinson, C. W., 301 Wilkinson, T. F., 443 Willaman, J. J., 491 Wille, F., 454 Williams, C. B., 76, 77 Williams, H. H., 110, 223, 320, 321 Williams, N. E., 274, 275 Williams, R. C., 128, 579, 584 Williams, R. H., 204, 352 Williams, R. J., 123, 375, 378, 383, 389 Williams, R. R., 443

Williams, V. R., 391 Williams, W. L., 385 Williamson, A., 282, 299 Williamson, S., 262 Willman, J. P., 304 Wilson, A. T., 386, 523, 524 Wilson, D. W., 16, 24, 196, 197, 235, 259, 488 Wilson, E. J., Jr., 397 Wilson, K., 294 Wilson, L. T., 303 Wilson, R. H., 365 Winchester, B., 200 Windaus, A., 155, 157, 160, 161 Winge, O., 466 Wingler, R. J., 211 Winkelmann, E., 178 Winkler, A. W., 110, 300 Winnick, T., 35, 280, 318, 377 Winstein, S., 158 Winter, H. A., 207 Wintersteiner, O., 161 Wintrobe, M. M., 306 Winzler, R. J., 234, 317 Wisansky, W. A., 598, 604 Wise, E. C., 145 Wisotsky, R., 211 Wiss, O., 261 Wissler, R. W., 263 Witebsky, E., 516, 519, 520, 525 Witsch, H. v., 225 Wixom, R. L., 354 Wohl, K., 419 Wokes, F., 426 Wolf, D. E., 279 Wolfe, H. R., 356, 518 Wolfe, J. K., 354 Wolff, G., 110 Wolff, H. G., 240, 265, 276, 348 Wolfrom, M. L., 450 Wollenberger, A., 317 Wood, A. J., 493 Wood, E. C., 319

Wood, H. G., 17, 18, 26, 194, 195, 196, 200, 229, 237, 255, 478, 484, 490 Wood, J. G., 417 Wood, J. L., 279 Woodruff, E. H., 593 Woods, D. D., 457 Woods, R. R., 251 Woodard, G., 557, 558 Woodward, C. R., Jr., 385, 458 Woodward, G. E., 499 Wooley, J. G., 123, 306 Woolley, D. W., 264, 287, 290, 293, 294, 295, 375, 376, 379, 381, 383, 388, 389, 442 Woolley, J. R., 354 Worden, A. N., 229 Worden, M. B., 307 Wormell, R. L., 144 Worsley, R. R. L., 545, 547, 548 Wotton, R. M., 111, 220 Wright, G. G., 506, 507 Wright, L. D., 284, 291, 294, 389 Wright, M. H., 379 Wu, C. J., 40 Wu, C. K., 607 Wu, Y. H., 186 Wurtz, E., 278, 289, 291, 383 Wyckoff, R. W. G., 119, 128, 579, 584 Wynd, F. L., 292, 586 Wynn, W., 112, 212, 221 Wyss, O., 387

Yakashuji, E., 425 Yamafuji, K., 11 Yarmolinsky, H., 285, 302 Yates, J., 160 Yeager, J. F., 564 Yemm, E. W., 418 Yoshihara, F., 11 Young, E. G., 492 Young, F. G., 208, 347 Young, L. E., 519 Young, P. A., 559 Young, R. M., 483 Young, W. J., 439 Younger, F. M., 331 Young-Yen, M. H., 444 Yurd, N., 132

Zahl, P. A., 523 Zambito, A. J., 145 Zamecnik, P. C., 39, 42, Zarafonetis, C. J. D., 310 Zathureczky, Z. L., 233 Zechmeister, L., 274, 275, 302 Zehender, F., 601 Zeidler, O., 553 Zeijlemaker, F. C. J., 421 Zeldis, L. J., 251 Zeller, E. A., 5, 262, 426 Zepplin, M., 330 Zerban, K., 426 Zfasman, E. M., 497 Zialcita, L. P., Jr., 226, Ziegler, J. A., 24, 51, 194, 196 Ziegler, J. E., Jr., 582 Ziegler, K., 178 Ziegler, P. T., 306 Ziff, M., 141 Zilva, S. S., 424, 427 Zima, O., 443 Zimmermann, B., 205 Ziskin, D. E., 365, 366 Zittle, C. A., 57, 124, 251, 255, 496 Zon, L., 523 Zorkorczy, J., 443 Zozaya, J., 324 Zscheile, F. P., 96, 275, 323, 408, 409 Zucker, L., 145

Zuniga, N. J., 324

Zwemer, R. L., 111, 220

SUBJECT INDEX

2,

26

26, 94,

75,

220

A	Acetylcholine (cont.)
Abortion, blood vitamin A and, 303	hydrolysis of, 63, 64
Acetaldehyde	synthesis of, 14, 24, 240
carboxylase inhibition by, 54	adrenotropic hormone and, 348
degradation of, 238	enzymic, 67
epinephrine inactivation by, 602	a-tocopherol and, 276
fixation of, 448	Acetylmethylcarbinols
formation of in plants, 421	optical rotation of, 489
oxidation of, 430, 455	spatial configuration of, 489
Acetate	Acetyl phosphate
butyrate formation from, 484, 485	condensation of, 239
in citric acid cycle, 237	oxidation of, 239
condensation of, types of, 488i	Acetylsulfanilamide, formation of, 24
formation from pyruvate, 487	Acrylonitrile, insecticidal action of, 550
isopropyl alcohol formation from, 484	Actin
metabolism of in liver, 236	in muscle, 119
oxidation of, bacterial, 479	specific viscosity of solutions of, 120
succinate formation from, 488	Actomyosin
utilization of, pathways for, 238	dissociation of, 120
Acetate oxidase, activity of, 13	properties of, 120
Acetic acid	Acylphosphate, reduction of, 484
acetylation of foreign amines and,	Adenine, analogues of, 386
237	Adenosine, bacterial growth and, 386
bacterial synthesis of, 489	Adenosinetriphosphate, 461, 480
cholesterol formation from, 237	activity of, 12, 450
condensation to acetoacetate, 237	in brain, anoxia and, 25
decomposition of by yeast, 456	carbon dioxide fixation and, 18, 194
degradation of, 238	codecarboxylase activity and, 252
fatty acid synthesis from, 237	decarboxylase activation and, 20
formation of, 237	fatty acid oxidation and, 24
metabolism of, 238	muscle contraction and, 120
oxidation of, tricarboxylic acid cycle	phosphate transfer from, 51
and, 16	production of, 233
reaction in liver and kidney, 236	pyruvate phosphorylation by, 51
synthesis of, 477	synthesis of, 419
Acetoacetate	of Thiobacillus, 475
condensation of, 235	Adenylpyrophosphatase
hyperglycemia and, 211	glucose fermentation and, 199
interaction with oxaloacetate, 236	of yeast, 452
reduction of, 234	solubility of, 452
Acetoacetic acid, oxidation of, fluoride	stability of, 452
and, 228	Adenylpyrophosphate, pyruvate decom-
Acetoin, 462	position and, 487
formation of, 464, 481, 488	Adipic acid, metabolism of, 234
optical activity of, 462	Adrenal cortex
oxidation of, 481	alloxan and, 206
preservation of, 464	hormones of
Acetone	action of, 349
formation of, 229	epinephrine and secretion of, 207
from acetate, 484	glycogenic activity of, 207
isopropyl formation from, 485	lymphopenia and, 517
Acetylcholine	production of, 349
action of in central nervous system, 67	types of, 349
in brain, 109	tumors of, 354

Adrenal gland, 353-54 adrenalectomy glycogen phosphorylation and, 206 hyperglycemia after alloxan injection and, 204 liver fat content and, 109 carbohydrate metabolism and, 206-7 cholesterol in, epinephrine and, 111 epinephrine content of, scurvy and, extracts of, activity of, 353 insufficiency of tissue phospholipids and, 233 vitamin C deficiency and, 230 renal function and, 353 sodium retention and, 354 Adrenochrome stability of, 596 structure of, 596 Adrenoxine cardioinhibitory action of, 608 formation of in vivo, 608 hypotensive action of, 597 mydriatic action of, 608 preparation of, 597 blood carotene level and, 303 tissue tocopherols and, 313 Agglutinins activity of, ninhydrin and, 514 of antimeningococcal sera, 508 group-specific, 508 isoagglutinins A and B, 513 purification of, 514 sedimentation constant of, 514 nitrogen content of, 508 from pertussis antisera, 524 type-specific, 508 Alanine bacterial fermentation of, 491 bacterial growth and, 386 bioassay of, 123 deamination of, 23, 248, 497 dehydrogenation of, 493 formation of from pyruvic acid, 255 isomers of, 318 L. casei growth and, 318 synthesis of, 258 B-Alanine bacterial growth and, 380 synthesis of, 145 Albumin, egg amino acid composition of, 125 complement removal and, 511 crystalline, denaturation of, 131 denatured, 36, 131, 507 electrophoretic mobility of, 131 purification of, 131

stability of, 131

viscosity of, 131

Albumin, egg (cont.) electrophoretic mobility of, 38 hydrolysis of, 37 products of, 38 monolayers of, 127 purification of, 131 sedimentation constant of, 38 specific volume of, change in, 136 Albumin, serum analysis of, isotope dilution method, 124 antibody complement fixation titer and, 513 denaturation of heat and, 35, 133 sodium caprylate and, 36, 133 sodium dodecyl sulfate and, 132 urea and, 35, 133 denatured, rate of digestion of, 133 electrophoretic mobility of, 143 phosphate buffers and, 141 molecular weight of, 129, 136 papain digestion of, 35 pyruvate utilization and, 480 regeneration of, 36 sedimentation constants of, 134 Alcohol formation of in plants, 421-22 oxidation of, bacterial, 481 Aldehyde oxidation of, 481 virus inactivation and, 587 anaerobic hydrogen metabolism of, 398 photochemical hydrogen uptake by, photoreductions in, 398 fluorescence of, 404-5 growth rate of, 412 oxygen production by, 404 photosynthesis in, 403 Michaelis constant for, 478 pigments of, 408 unicellular, culture of, 411 Alkaloids Anabasis, 540 Erythrophleum, 540 Nicotiana, 540 synthesis of, 541 Schoenocaulon, 548 Solanum, 180 absorption spectra of, 182 Hofmann degradation of, 184 structure of, 180-81 steroid, 180-87 sugar-moiety of, 183-84 Veratrum, 186

Allantoin, fermentation of bacterial, 492 products of, 492 Alloemicymarin, cleavage products of, Alloperiplocymarin, cleavage products of, 171 Alloxan adrenal cortical lesions and, 206 destruction of in blood, 203 determination of, 203 diabetogenic action of, protection against, 204 glucose tolerance and, 206 hyperglycemia and, 204 Alopecia, biotin and, 291 Aluminum, yeast fermentation and, Amine oxidases, 10-11 of liver, inhibition of, 607 Amines acetylation of, 248 aliphatic, 594 aromatic, acetylation of, 238 dissociation constants of with enzymes, 595 Amines, pressor activity of, structure and, 593, 594-95 deamination of, rates of, 594 detoxication of in vivo, 603 elimination of, 605 inactivation and detoxication of, 593-616 phenolic, 601 structure of, 594, 595 Amino acid metabolism, 247-72 ascorbic acid and, 27 biochemical genetics of, 259 deamination, 23, 247, 492, 593, 594 aerobic, 496 amphetamine and, 601 ascorbic acid and, 601 enzymatic, 261 by liver, 44 mandelic acid and, 5 mechanism of, 594 rate of, 23 decarboxylation, 19-21, 252-55, 385 enzymes and, 494-95 pyridoxal phosphate and, 252 vitamin Be and, 1 dehydrogenation, 493 Krebs-Henseleit cycle, 262-63 N¹⁵ in studies of, 247 oxidations bacterial, 496 catechol system and, 424

in plants, 424

protein hydrolysis and, 444

od.

ter

by,

Amino acid metabolism (cont.) transamination, 21-23, 252-55, 385 bacteria and, 496 pyridoxine and, 253, 278 d-Amino acid oxidase, activity of, 13 1-Amino acid oxidase, 5 activity of, 23 Amino acid oxidases, 261-62 activity of, 261, 594 stability of, 496 Amino acids, 119-54 acetylation of, 238 activation of, 248 arginase inactivation by, 42 assay of, 496 biological, 123 bacterial fermentation of, 491 bacterial growth and, 491 catalytic action of, 480 cytochrome inhibition by, 608 decomposition of, enzymes and, 494determination of, 125 enzymic, 57 microbiological method, 375 by partition chromatography, 124 in protein hydrolysates, 20 essential deamination of, 497 for growth, 123, 263 plasma protein production after plasmapheresis and, 251 in yeast, 444 formation of, 248 hemoglobin formation and, 251 isomers of, naturally occurring, 124 non-essential, synthesis of, 258 in pituitary growth hormone, 349 in proteins, 41, 123-27 racemization of, 124 separation of, chromatographic, 124specific volume of, change in, 137 synthesis of, 145-46, 261 scurvy and, 256 therapeutic use of, 265 virus reactivation and, 587 see also specific acids d-Amino acids, 259-61 in penicillin, 261 in proteins, 259 I-Amino acids, oxidation of, 5, 23 p-Aminobenzoic acid acetylation of, 24, 238 antibacterial activity of, 310 bacterial growth and, 458 carboxylase inhibition and, 54 Rocky Mountain spotted fever and,

Anemia (cont.)

p-Aminobenzoic acid (cont.) spotted fever immunity and, 310 sulfanilamide activity and, 457 sulfonamide inhibition by, 279 synthesis of by yeast, 292 in yeast, 457 Aminopeptidase, properties of, 39 Aminophenol, epinephrine oxidation and, 598 Ammonia, pyruvate oxidation and, 480 Ammonium, yeast fermentation and, 435 Amphetamine activity of, 606 amino acid deamination and, 601 brain respiration and, 595 deamination of, 600 degradation of in liver, 606 detoxication of, 595 dissociation constant of, 595 excretion of, 605 ascorbic acid feeding and, 606 liver function and, 605 glucose oxidation and, 595 intestinal absorption of, 605 Amylamine, brain respiration and, 595 Amylases, 60-61 action of, 13, 80-82 bacterial, 60-61, 497 classification of, 80 concentration of, 497 development of in germinating cereals, 61 inactivation of by nitrous acid, 60 kinetic studies of, 60 in plants, 419 salivary, 81-82 stability of, 84 structure of, 60 Amylopectin, 75 hydrolysis of, 81 molecular weight of, 83 purification of, 77 structure of, 82 synthesis of, 50, 82-86 Amylose, 75 hydrolysis of, 83 molecular conformation of, 77-80 molecular weight of, 79 properties of, 79 separation of, 76 solubility of, 78, 85 synthesis of, 49, 82-86 Anabasine, 540 Anaphylaxis, 511 Androgens, see specific substances

Anemia

isoleucine deficiency and, 255

macrocytic, vitamin Be and, 292

low-protein diet and, 258

lysine deficiency and, 259

nutritional, types of, 290-91 pantothenic acid deficiency and, 290 pernicious folic acid and, 284 immunology and, 520 pyridoxine deficiency and, 307 riboflavin deficiency and, 306 see also Erythrocytes, destruction of and Hemoglobin, formation of Anesthetics, carbohydrate metabolism and, 211 Angiotonin inactivation of, 355 purification of, 355 Aniline, epinephrine oxidation and, 598 Anoxia, see Oxygen deficiency Antibiotics action of, 14 mechanism of, 375 Antibodies, 512-17 agglutination tests for, 515 anti-pneumococcal, 528 bactericidal action of, 527 bivalence of, 527 determination of, 505 to distemper virus, 515 to erythrocytes, 509 estimation of, 511, 512, 515 formaldehyde and, 514 formation of, 249, 508 nutrition and, 505 globulins as, 508 group-specific, 509 half-life of, 508 inactivation of, 507 to influenza virus, 515 isoantibodies A and B, 510 mobility of, 513, 517 molecular weight of, 513 mutation induction by, 516 ninhydrin and, 514 to pneumococcus, 515 production of, 516 properties of, 512 proteins of, 508 purification of, 513, 514 to renin, 518 requirement for immune reactions, 511 separation of, electrophoretic, 512 structure of, 249 to syphilis, 515 to tuberculin, 515 tyrosinase precipitation by, 508 to viruses, 510 Antigen-antibody reactions agglutination, 514, 515, 516, 519 type-specific, 524 aggregation, 507

Arginase (cont.)

Antigen-antibody reactions (cont.) complement fixation, 511, 518 cross-reactions, 507, 518 denaturation and, 506, 507 erythroblastosis fetalis, 516 precipitin reactions, 527 Antigens, 518-27 bacterial, 520 blood group substances as, 520 chemically altered, 526-27 complement fixation titer of, 513 determination of, 505 of edema fluid, 509 estimation of, 512 of hemolytic streptococcus, 523 histamine-protein, 526 molecular weight of, 506 of pneumococci, 522 precipitation of, 512 purification of, 509 sedimentation of, 515 somatic, 523 stability of, 509 thermolability of, 521 of typhoid, 523 Antigonadotropins, 356 Antihormones, 356 Antisera to diazotized arsanilic acid, 526 hemolytic activity of, 514 to metakentrin, 518 in multiple myeloma, 509 photooxidation of, 514 protective power of, 508 specificity of, 526 Antitoxin, diphtheria, inactivation of by urea, 507 Apoenzymes, 253, 495 production of, 254 Apozymase, preparation of from yeast, 454 d-Arabinose fermentation of, 447 glycoside containing, 176 I-Arabinose, phosphorylation of, 450 Arachain activity of, 35 electrophoretic studies of, 122 Arachidonic acid absorption coefficients of, 95 identification of, 98 spectroscopic detection of, 97 ultraviolet absorption of, 99 Arginase, 42-44

activity of, 13, 44, 262

metallic ions and, 43-44

destruction of by iodine, 44

arginine-arginase reaction, 43

inhibition of, 42

in kidney, steroid hormones and, 43 stability of, 43-44 Arginine, 257 analysis of, colorimetric, 124 bioassay of, 123 deamination of, 259, 497 decarboxylation of, 124, 252 deficiency of, testis growth and, 257 excretion of, 257 hydrolysis of, rate of, 42 metabolism of, steroid hormones and, 43 spermatogenesis and, 257 in yeast, 444 d-Arginine, urea formation from, 257 Arsenate dehydrogenase and, 493 esterification of, 439 hexosediphosphate dephosphorylation and, 438 yeast metabolism and, 438 Arsenic, excretion of, 14 Arthritis gold salt therapy and, 110 rheumatoid, plasma lipids and, 110 Ascorbic acid amino acid metabolism and, 27 amphetamine inactivation and, 606 assay of, dye-titration method, 323 availability of, 322 copper and, 282 vegetable oxidases and, 281 as color preservative in frozen fruits, conservation of, nitrogen and, 313 cytochrome inhibition by, 608 deaminations by, 601 decomposition of, bacterial, 483 deficiency of diet and, 297 tooth damage and, 366 estimation of dye-titration method, 313 indophenol-xylene extraction method, 314 micromethod, 314 oxidation-reduction procedure, polarographic method for, 317 excretion of, 281 in fruits, 322 processing and, 327 in green vegetables, retention of, 324 loss of, vitamin C requirement and, 281 in milk, 320 pasteurization and, 325 sunlight and, 320

Ascorbic acid (cont.) oxidation of, 277, 429, 601 caffeic acid and, 424 copper and, 426-27 to dehydroascorbic acid, 427 peroxidase and, 426 in plasma, chlorobutanol feeding and, 288 in plants, 426 requirement for, 299 retention of in canned foods, 330 sucrose and, 328 temperature and, 327 stability of, 322 stabilization of, 313 storage of, 304 synthesis of, 388 carotene intake and, 285 tolerance of, 281 in tomatoes, environmental factors and, 323 in urine, pH and, 287 in vegetables processing and, 328, 329 retention of, 329 storage and, 328 virucidal activity of, 293 Ascorbic oxidase, 4 activity of, 4, 427 inhibition of, 427 in plants, 426-27 poisoning of, 426 Ascosterol, isolation from yeast, 442 Asparagine, bacterial growth and, Aspartate, pyruvate oxidation and, 480 Aspartic acid bacterial fermentation of, 491 bioassay of, 123 deamination of, 23, 497 intravenous injection of, vomiting produced by, 251 oxidation of, caffeic acid and, 424 synthesis of, 258 Atabrine, thiamine-sparing action of, 288 Atherosclerosis blood cholesterol and, 110 lipids and, 219 Azide bacterial fluorescence and, 407 blood composition and, 211

dehydrogenase and, 493

enzyme inhibition by, 211

enzyme poisoning by, 423

photosynthesis and, 402

Bacilli, tubercle phthioic acid from, 103 protein antigen of, 122 Bacteria absorption spectra of, 400 acetate utilization by, 479 acid-fast, 479 respiration of, 479 adaptation of, 440 asparaginase in, 497 biotin requirement of, 376 carbon dioxide fixation and, 487 carbon dioxide requirement of, replacement of, 479 carboxylase of, 54 catalytic action of, 488 cellulose-fermenting, 490 chemo-autotrophic, 475-76 chemosynthesis in, 397 chlorophyll from, 400 cholesterol decomposition by, 482 classification of, 479 coagulase activity of, 500 cytochrome content of, 493 decarboxylase activity of, 54 vitamin Be and, 55 enzyme production by, 1, 47, 493-500 fluorescence of, 406 carbon dioxide and, 407 glycerol utilization by, 489 gram-negative, 483 gram-positive, 483, 491 heterotrophic, carbon dioxide utilization by, 476-79 inhibition of bacteriophage and, 489 streptothricin and, 489 lactic acid formation and, 489 luminescence of, 494 peroxidase activity of, 494 phosphorylations and, 482 photosynthesis in, 397, 410 pigmented, 488 purple carbon dioxide uptake by, 410 classification of, 410 photochemical hydrogen uptake by, 410 physiology of, 410 pyruvate assimilation by, 480 respiration of, 479, 493 chloretone and, 482 ribonuclease activity of, 499 sulfur, 400 photosynthesis-fluorescence relationship in, 405 sulfur utilization by, 475 transaminase activity of, 22 pyridoxal deficiency and, 254

B

B

B

B

E

E

Bacteria (cont.) transaminations and, 496 virus adsorption on, 587 Bacterial growth amino acids and, 491 carbon sources for, 491 fatty acids and, 229 inhibition of, 436 pH and, 490 pyridoxine deficiency and, 496 Bacterial metabolism, 475-504 anaerobic, 483-93 capsulation, 499 carbon dioxide utilization, 476-79 chemo-autotrophic, 475-76 energy sources, 476, 490, 491 glucose assimilation, 481 hydrogen utilization, 476 iron and, 482, 483, 486 manometric data on, 481-82 oxidative, 479-83 oxygen tension and, 482 pH and, 482 products of, 492 temperature and, 482 tetrathionate and, 494 Bacteriophage, action of, 499 Barbiturates protective action against DDT, 564 serum cholinesterase and, 66 Barium, yeast fermentation and, 435 Bence-Jones protein, 509 Benzoic acid, epinephrine oxidation and, Benzoylcholine, hydrolysis of, 63 Beryllium, yeast fermentation and, 435 Biotin, 376-78 activity of, structure and, 280 analogues of, 377 bacterial growth and, 376 biological activity of, 318 biosynthesis of, 377 chemico-biological aspects of, 280 deficiency of alopecia and, 391 anemia and, 291 paralysis and, 291 poliomyelitis susceptibility and, destruction of by potassium permanganate, 318 gestation and, 291 hydrogenolysis of, 376 liver fatty and, 232 metabolism of, 284 in milk, 321 muscle creatine and, 291

oxidation of, 376

structure of, 377

requirements for, 291

Biotin (cont.) synthesis of, 279 in digestive tract, 284 yeast growth and, 279 yeast requirement for, 376 Bisnordesoxycholic acid, lactonisation of, 162 Blood carbon dioxide transport by, 52 cholesterol level of, atherosclerosis and, 110 clotting of penicillin and, 47 pH and, 46 thiol-vitamin K relationship in, 287 thrombin action and, 46 composition of, enzyme inhibitors and, deproteinization of, 212 fetal, lipids of, 110 hematopoiesis, isoleucine and, 256 ketone bodies in, 220 ketonemia, cardiac glycogen and, 239 see also Erythrocytes Blood lipids, 222 blood sugar and, 222 see also Fat metabolism Blood pressure dihydroxyphenylalanine and, 58 phenethylamine and, 603 vitamin E deficiency and, 287 Blood proteins clinical uses of, 120 separation of, 120 Blood sugar, see Glucose, of blood calcium deposition in, vitamin D and, formation of, calcium in diet and, 363 fragility of, hypervitaminosis A and, mineralization of, vitamin D and, 276 osteoclasis, parathormone and, 286 resorption of, vitamin D deficiency and, 286 Brain acetylcholine of, 109 cholinesterase activity of, 65 barbiturates and, 66 glycolysis in, 14 glycolytic activity of, poliomyelitis and, 200 glycolytic enzyme systems of, 26 ketone body utilization by, 239 lipids of, 111 monoamine oxidase activity of, 603 phosphocreatine content of, anoxia and, 25 phospholipids in, 108 phosphorylase activity of, 50

Bromelin, activity of, 13 Burns nitrogen balance and, 263 proteolytic enzymes from, 39 Butanediol, bacterial production of, 489 2,3-Butanediol, stereoisomers of, 489 Butyl alcohol, formation from acetate, 485 Butylamine, 595 Butyl carbitol thiocyanate, insecticidal action of, 552 Butyric acid fermentation of, 476, 483-87 intermediates in, 484 formation from acetate, 484 hyperglycemia and, 233 oxidation of, 234 bacterial, 479 reduction of, 485 Butyrylphosphate, formation of, 484 Cadmium anemia and, 365 tooth bleaching and, 365 yeast fermentation and, 435 Caffeic acid amino acid oxidation and, 424 carbohydrate respiration and, 424 oxidation of, 424 Caffeine cell division and, 12 cholinesterase inhibition by, 63 egg respiratory activity and, 12 plasma fibrinogen and, 266 urea formation and, 44 Calciferol, ascorbic acid storage and, 305 deficiency of, tooth formation and, 363

fibrin clotting and, 39 intestinal absorption of, vitamin D and, 276 yeast fermentation and, 435 Cancer, see Neoplasms Capillaries, resistance of, hesperidin and, Caproic acid formation of, 485, 486 isotopes of, 486 Carbinamines brain respiration and, 595 bonds, 201-3

deamination of, 594 stability of, 595 Carbohydrate metabolism, 193-218, 445 aerobic, 26 anesthetics and, 211 dihydrocozymase and, 50 enzymatic synthesis of glycosidic

295

Carbohydrate metabolism (cont.) enzymes and, 12, 198-201, 490, 497-99 glycolysis Embden-Meyerhof scheme of, 451 inhibition of, 446 hormone control of, 206-9 insulin and, 209-10 phosphorylating enzymes and, 198 by spermatozoa, 233 tracer studies of, 193-98 tricarboxylic acid cycle in, 194 yeast and, 440 see also Glucose, of blood; Glycogen, formation of; Muscle, metabolism of; etc. Carbohydrates alcoholic degradation of, 458 determination of, 212 formation of, photosynthesis and,

oxidation of in plants, 417 see also Carbohydrate metabolism plant respiration and, 417 protein protection by, 424 storage of in yeast, 445 survival times on an exclusive diet of, synthesis of, 202, 203 enzymes and, 497-99 priming mechanism for, 85-86

411

interconversion of, 499

tricarboxylic acid cycle and, 17 thiamine-sparing action of, 231 utilization of by yeast, 453 in viruses, 580 see also Polysaccharides and specific substances Carboligase, 462

Carbon dioxide biological utilization of, 194 fixation, 19, 194, 476 in heterotrophic organisms, 18-19 tracer studies of, 193-98 by yeast, 454 fluorescence and, 407 reduction of, 477 yeast growth and, 455 Carbon disulfide, insecticidal action of, 559

Carbonic anhydrase, 52-53 activity of, 13, 53 in erythrocytes, 52-53 function in blood, 52 inhibition of, sulfonamides and, 52 stability of, 53 Carbon monoxide catalase activity and, 2-3 enzyme poisoning by, 426

respiratory enzyme inhibition by, 1

Carbon tetrachloride, liver function and, Carboxyhemoglobin, analysis of, isotope dilution method, 124 Carboxylase, 53-54 activity of, 54, 455 sulfonamides and, 54 inhibition of, 53-54 oxalosuccinic, 7 pH-optima of, 54 in plants, 421 synthetic, 54 from yeast, 54 inhibition of by sulfathiazole, 277 see also Diphosphothiamine p-Carboxyphenylarsine, enzyme inhibition by, 228 Carcinogenesis butter yellow and, 111 methylcholanthrene and, 112 Carcinoma, see Neoplasms Cardiolipin, complement fixation tests with. 518 Carotene assay of, 311 biological value of, 302 in butter, 325 in carrots, dehydration and, 327 determination of, colorimetric, 284 destruction of, oxidation and, 332 in diet, ascorbic acid synthesis and, 285 elimination of in colostrum, 302 epoxides of, 274-75 estimation of, 312 excretion of, 302 in milk, 325 in plasma, 302 requirement for, 298 stability of, 327 utilization of, 230 in vegetables, 323 **B**-Carotene preparation of, 274 purification of, 274 stereoisomers of, 274 Carotene, isolation of, 275 Carotenoids in carrots, 323 determination of, 409 in egg yolk, 304 photosynthesis and, 408 see also Xanthophylls and specific substances Casein amino acid composition of, 125 choline equivalent of, 308 electrophoretic pattern of, 142 heat of solution of, 137

hydrolysis of, 39

99

1

sm

m

of.

ific

of,

Casein (cont.) proteolytic degradation of, 40 purification of, 120 specific volume of, change in, 136 vitamin content of, microbiological determination of, 317 Castration kidney weight and, 43 prostate metabolism and, 27 Catalase, 2-3 absorption spectrum of, 2 action of, 2, 13 bacterial, inhibition of, 493 reduced, stabilization of, 2 Catechol, formation of, 599 Catechol oxidase cyanide poisoning resistance of, 423 inhibition of, 427 plant respiration and, 423-25 poisoning of, 426 tissue content of, 596 Cathepsin, activity of, 13 Cell metabolism, 25-28 Cellobiose, formation of, 490 Cellobioside, preparation of, 164 Cellulose bacterial fermentation of, 490 fermentation products of, 490 Cephalins in brain, 108 in heart, 108 hydrolysis of, 62, 109 in liver, 108, 223 Cereals, vitamin content of, 324 Cerebral cortex fatty acid content of, 111 fatty degeneration of, 111 respiration of, carbinamines and, 595 Cerebrosidase, activity of, 13 Cerebrosides in liver, 223 phospholipase resistance of, 62 Cerium, yeast fermentation and, 435 Cesium, yeast fermentation and, 435 Cevadine insecticidal action of, 549 structure of, 549 Cevine, cleavage products of, 186 Chaulmoogric acid absorption spectrum of, 103 preparation of, 103 Chenodesoxybiliobanic acid, 161 Chenodesoxycholic acid, 161 spatial configuration of, 161 Chloral hydrate, glucose oxidation and, 482 Chlorarsines, lipoid solubility of, 13 Chloretone, bacterial respiration and, Chloroform, virus infectivity and, 581

Chlorofucine, 408 p-Chloromercuribenzoate, enzyme inhibition by, 228 Chloroplastin, 403 Chloroplast pigments, 398 fluorescence of, 398 photochemical behavior of, 398 separation of, by chromatography, 408 spectroscopy of, 398 Chloroplasts absorption curves of, 409 activity of, temperature and, 402 chlorophyll in, 400 disintegration of, supersonic vibration and, 403 hydrogen peroxide decomposition and, 402 illumination of, 401 oxygen evolution from, 401, 402, 404 reflection curves of, 409 structure of, 398 Chlorophyll absorption spectra of, 399 chemistry of, 409 energy transfer by, 409 fluorescence of, 408 medical uses of, 408 oxygen evolution and, 409 photoperiodism and, 409 Chlorophyll-a, 399, 409 Chlorophyll-b, 399, 409 Chlorophyll-c, 408-9 Chlorophyll-d, 409 Cholestane, 158 Cholestane-2.3-diol, formation of, 163 Cholestane-3,6-diol, isomers of, 155-57 Cholestanol formation of, 442 isomers of, 442 Δ5-Cholestene, formation of, 161 Cholestenone, production of, 164 Δ*-Cholestenone, production of, 482 Cholesterol in adrenal gland, epinephrine and, 111 bacterial growth and, 229 of blood, atherosclerosis and, 110 in cerebral cortex, 111 complement fixation tests with, 518 conversion of to progesterone, 164

decomposition of, 482

see also Blood lipids

products in, 483

action of, 62

isotopic analysis of, 238

Cholesterol esterase, 62-63

Cholesteryl-5:6-oxides, 157-58

microbiological degradation of, 164

Cholesteryl oxides, fission reactions of,

Cholic acid, oxidation of, intermediate

bacterial growth and, 378 deficiency of body weight and, 308 liver fatty infiltration and, 223, 231 liver function and, 308 myocarditis and, 308 nephrosis and, 264 determination of, 319 colorimetric method for, 317 excretion of, 284 lipotropic action of, 233 liver ceroid deposition and, 308 in liver, determination of, 315 phospholipid activity and, 222 in plasma, pancreatectomy and, 232 synthesis of, 294 Choline acetylase, activity of, 23 Cholinesterase, 63-67 activity of, 13 in bacteria, 499 differentiation of, 63 distribution of, 65 inactivation of, 63 inhibition of by sodium fluoride, 562 in nervous system, 64, 65 specificity of, 63 types of, 63 Chymotrypsin activity of, 37, 524 insulin inactivation by, 352 molecular weights of crystals, 136 proteolytic activity of, 42 Cinchophen, glucose fermentation and, 458 Cinerolone insecticidal action of, 543 source of, 542 stability of, 542 structure of, 542 Cinobufagin acetylation of, 177 cardiac activity of, 177 Citrate fermentation of pH and, 490 products of, 490 plant respiration and, 428 production of, 236 Citric acid degradation of, 238 in plants, 427 production of, 15 Citrin, 295 Citrinin antibiotic action of, 12 oxidations and, 12 Coagulase, 500 Cobalt, yeast fermentation and, 435 Cobalt oleate, catalytic action of, 103

SUBJECT INDEX

Cobefrine, 595 activity of, oral, 607 excretion of, 609 inactivation of, 607 sulfate formation and, 611 Cobra venom enzyme inactivation by, 109 hemolysin from, 121 Cocaine, epinephrine potentiation and, 611 Cocarboxylase in plants, 421 Codecarboxylase activity of, 252 occurrence of, 252 Coenzymes, 10, 55, 56, 252, 253, 495 destruction of, 199 dialysis and, 23 nicotinamide and, 200 formation of, 254 in kidney, 12 reactivation of, 22 Coffee, niacin content of, 332 Collagen, amino acid composition of, 125 Collodion, antibody agglutination and, Colon, absorption from of thiamine, 299 Colostrum fatty acid composition of, 224 riboflavin in, 325 vitamin content of, 321 Complement, 527 bactericidal action of, 527 components of, 527 fixation of, 511, 518 hemolytic properties of, 527 Conarachin, electrophoretic studies of, 122 Convallatoxin cardiac activity of, 165, 176 cleavage of, 171 Copper ascorbic acid oxidation and, 426-27 carbohydrate metabolism and, 435 Coprostane, 158 Cornea, vascularization of, pregnancy and, 300 Corticosterone glycogenic potency of, 354 side-chain configuration in, 163 Cozymase activity of, 51 bacterial growth and, 378-80 reduction of, 51, 439 Creatine from guanidoacetic acid, 265 phosphorylation of, 200 o-Cresolindophenol, blood pressure in, hypertension and, 604

Crotonic acid, determination of, 220

31

ıd.

Cryptostanedione, 442 Cryptostenediol, formation of, 442 Cryptosterol constitution of, 442 isolation of, 442 Cvanide blood composition and, 211 carbon dioxide fixation and, 19 deaminase inactivation and, 492 dehydrogenase and, 493 egg respiratory activity and, 12 enzyme inactivation by, 39, 211 enzyme poisoning by, 423, 426 fluorescence and, 407 plant alcohol formation and, 421 Cyclohexanone, insecticide solvent, 560 Cyclopentenophenanthrene, isolation of, 186 Cymarin, 165 cardiac activity of, 176 isolation of, 164 Cysteic acid deamination of, 23 decarboxylation of, 57-68 decomposition of, 492,493 enzyme inactivation by, 39 fatty acid reduction and, 456 hydrogen sulfide liberation from, 47 in yeast, 444 Cystine, deficiency of, 308 Cytochrome, 1 in plants, 425 in yeast, 425 Cytochrome-a, 1 in bacteria, 493 in plants, 425 Cytochrome-b, 1 in bacteria, 493 Cytochrome-c amine oxidation and, 601 in heart, 425 in kidney, hypertension and, 11 neoplasms and, 1 in plants, 425 reduction of, 7, 10 tissue phosphate during anoxia and, 25 Cytochrome oxidase, 1 activity of, 13 hypertension and, 11 renin and, 11 distribution of, 1 inhibition of, 427

DDT absorption of from digestive tract, 556 through skin, 557 DDT (cont.) appetite and, 557 application of in paint, 555 in sprays, 554, 555 cardiac hemorrhages and, 557 elimination of, 557 insecticidal action of, 552 larvicidal action of, 554 liver damage and, 557 malaria control and, 555 melting point of, 553 nervous system and, 562 physical properties of, 553 preparation of, 553 purification of, 553 solubility of, 553, 558 structure of, 552 synaptic resistance and, 564 toxicity of, 554 Deaminases, inactivation of, 492 Deamination, see Amino acid metabolism and specific substances Decarboxylases activity of, 20, 55, 496 thiamine deficiency and, 57 amino acid, 19-20, 54-58, 124, 495 activation of, 56 amino acid estimation and, 57 coenzyme of, 56-57 pH optima for, 496 protein analysis and, 57 purification of, 496 specificity of, 495 types of, 494-95 bacterial, 54-55, 252, 495 c-factors of, 55 dissociation of, 486, 495 inhibition of, 55 isolation of, 19 mammalian, 495 separation of, 495 specificity of, 20, 55, 486 stability of, 486 Deguelin insecticidal action of, 545 structure of, 545 Dehydroandrosterone, incomplete oxidation of, 483 Dehydroascorbic acid formation of, 427 mutarotation of, 276 reduction of by glutathione, 427 Dehydrogenase aconitase, 427 activity of, 13, 423 aerobic, 423 alcohol, 422 poisoning of, by iodoacetate, 428 arsenate and, 493

Dehydrogenase (cont.) azide and, 493 citric, 422 crystallization of, 67 cyanide and, 493 of fatty acids, 219 formic, 422, 423 fumarase, 427 glucose, 422 glyceraldehyde phosphate, activity of, 198 glycerophosphoric, 422 isocitric, 6-8, 422 in plants, 427 specificity of, 7 lactic, 422, 423 malic, in plants, 427 of muscle, 121 oxalic, 422, 423 oxidation mechanism of, 596 in plants, 422-23 specificity of, 597 succinic, in plants, 427 triose, activity of, 8 triosephosphate, 8 see also d-Amino acid oxidase, etc. Dehydrohyodesoxycholic acid, 157 Dehydroluciferin, photochemical inac-tivation of, 494 Desoxycorticosterone glycogen phosphorylation and, 206 nephrosclerosis and, 348 Desoxyephedrine, excretion of, 605 Desthiobiotin activity of, 376 bacterial growth and, 377 chemico-biological aspects of, 280 optical activity of, 279 Desulfurase activation of, 493 inactivation of, 47 Detoxification, see under Liver and specific substances Deuterium, carbohydrate metabolism studies with, 197 Development, embryological fetal fat composition, 221 fetal lipid content during, 112 fetal phospholipids and, 112 Dextrans formation of, 457 in plants, 89-90 production of, 89 Diabetes acidosis of, glucose and, 240 alloxan, 203-6 adrenalectomy and, 206 blood ketone levels and, 239 cardiac glycogen and, 239 fatty acid synthesis and, 197

I

Diabetes (cont.) alloxan (cont.) gluconeogenesis in, 197 glycosuria of, 205 growth and, 205 insulin requirement of, 205 ketonuria and, 240 lipid synthesis and, 225 liver carbohydrate formation and, pancreatectomy and, 205 plasma phosphate and, 206 experimental anterior pituitary gland and, 347 pancreatectomy and, 207 pituitary extract and, 208 yeast and, 301 pancreatectomy and, 352 Diabetes mellitus, thyroid gland and, 352 Diamine oxidase, 6-7 activity of, 13 2,4-Diamylcyclohexanol, pyrethrin activation by, 566 Diaphragm, ketone body utilization by. Dicarboxylic acid cycle, in plant respiration, 427-28 Dicarboxylic acids, synthesis of, 476 Dichlorodifluoromethane as an insecticide disseminator, 560 vapor pressure of, 560 1,2-Dichloropropane, larvicidal action of, Dicholesteryl ether, isolation of from spinal cord, 111, 155 Diethyldithiocarbamate, ascorbic oxidase activity and, 427 Diginin hydrolysis of, 175 isolation of, 175 Digitonide, precipitation of, 110 Digitoxigenin, preparation of, 166 Digitoxin preparation of, 166 structure of, 166 Digoxigenin, dehydrogenation of, 171 Dihydrocozymase dehydrogenation of, 453 determination of, 6 ultraviolet absorption spectrum of, 6 Dihydrocryptosterol, 442 Dihydroxyphenylalanine blood pressure and, 58 decarboxylation of, 58 formation of, 599 from tyrosine, 424 oxidation of, 3, 424, 597 Dihydrozymosterol, ozonolysis of, 442

of,

ac-

and

sm

Dinitro-o-cresol, insecticidal action of, Diphosphopyridine nucleotidase, glycolysis inhibition by, 26 Diphosphopyridine nucleotide, bacterial growth and, 379 Diphosphothiamine carboxylase inhibition by sulfathiazole and, 54 destruction of, 54 as enzyme constituent, 493 synthetic, 278 thermal destruction of, 278 Dipyridyls, insecticidal action of, 550 Disaccharides fermentation of, 467 microorganism utilization of, 50 synthesis of, 50 Ducitol, in yeast, 444 Duodenum lipoidosis of, 226 lipolytic activity of, 220

E

Edestin amino acid composition of, 125 hydration value of, 135 specific volume of, 137 structure of, 126 Eggs respiratory activity of, caffeine and, riboflavin in, 322 thiamine in, 321 vitamins in dehydration and, 326 storage and, 326 Eleostearic acid determination of, spectrographic, 97 in tung oil, 98 Elliptone insecticidal action of, 545 structure of, 545 Emicymarin cleavage of, 171 isolation of, 165 structure of, 171 Emulsin, action of, 441 Endotoxins, 523 hemorrhagic action of, 523 toxicity of, 523 Enterogastrone, 354 Enzymes activity of, sulfhydryl group and, 12-13, 228 adaptive, 466 amino acid decomposition and, 494-97 ascorbic-dehydroascorbic acid system,

601-2 bacterial, 1, 493-500 Enzymes (cont.) bacterial (cont.) action of, 47 structure of, 47 carbohydrate decomposition and, 497carbohydrate metabolism and, 198-201, 490 crystalline, 67 cytochrome system, 595-601 fibrinolytic, 40-41 flavoprotein, 5-6 dual specificity of, 5 properties of, 5 fungal, 423 glycosidic bond synthesis and, 201-3 hormone destruction by, 351 hydrogen sulfide liberating, 47-48 inactivation of, 37 malonic acid and, 10 inhibition of, 11-14, 211, 228 pyrophosphate and, 493 iron porphyrin-containing, 1-3 levan-synthesizing, 498 monoamine oxidase system, 593-95, 603 nonoxidative, 35-74 nonproteolytic, 42-67 oxidative, 593 phenolase system, 595-601 phosphorylating, 87 polymerosynthease, 90 proteolytic, 35-42 in burned areas, 39 dental caries and, 369 tooth calcification and, 362 see also Papain, Trypsin, etc. regenerated, 2 respiratory, 422-25, 493 inhibition of, 1 in kidney, 12 stability of, 495 sulfhydryl, 12-13 yeast fermentation and, 445-46 see also Coenzymes; Dehydrogenase; and specific substances Ephedrine activity of, 593 brain respiration and, 595 deamination of, 595 excretion of, 605 formation of, 462 inactivation of in vivo, 606 preparation of, 464 structure of, 462 vasoconstriction and, 606 Epicholesteryl acetate, formation of, 158 Epilepsy, serum cholinesterase and, 66 Epinephrine activity of, 593

Epinephrine (cont.) adrenal cholesterol and, 111 adrenal cortex hormone secretion and, 207 assay of, colorimetric, 596 deamination of, 594, 595 dehydrogenase activity and, 596 glyceraldehyde dehydrogenation 597 inactivation of, 595, 602, 607 cytochrome system and, 608 in liver, 607 sulfate formation and, 611 organic sulfate excretion and, 610 oxidation of, 595, 597 color change in, 597 melanin precipitation and, 597 by phenoloxidase, 353 by tyrosinase, 598 potentiation of, 611 pressor activity of, 597 secretion of, 611 succinic acid dehydrogenation by, 597 sugar utilization and, 207 synthesis of, 607 **Epinine** degradation of in vivo, 609 inactivation of, sulfate formation and, 611 Episterol, isolation of from yeast, 442 Ergosterol determination of, 313 formation of, 443 irradiated, toxicity of, 366 Erythroblastosis fetalis, 516 Erythrocytes agglutination of, 516 by influenzal virus, 577 carbonic anhydrase in, 52-53 cholinesterase in, 66 erythropoiesis, pyridoxine deficiency and, 290 lipoproteins of, 574 permeability of to amino acids, 265 V-factor content of, 379 Esterase activity of, 13 see also Cholinesterase and specific enzymes Ethanolamine bacterial growth and, 378 determination of, 108, 222 in plasma, 108 Ethyl alcohol, dehydrogenation of, 493 Ethylamine, deamination of, 594 Ethylene glycol, degradation products of, 448 Ethylene oxide, insecticidal action of, 550

E

Eye conjunctivitis, nutritional state and, 298 lesions of, riboflavin deficiency and, 300 lewisite action on, 14

ıd.

97

hi

Cy

fic

of.

of.

F Fat antirachitic effect of, 230 phanerosis of, 111 storage of in yeast, 445 Fat, depot antioxidants in, 113 composition of, 221-24 deposition of, 234 distribution of, 220-24 fetal, 221 measurement of, 219 specific gravity of, 221 Fat metabolism, 219-46 absorption anoxia and, 220 hydrolysis and, 61 quinine and, 220 enzymes and, 12, 219, 227-29 lipoidosis, 226 lipolysis in homogenized milk, 224 neoplasms and, 226-27 phosphorylation and, 233 by spermatozoa, 233 tricarboxylic acid cycle in, 194 vitamins and, 230-31 see also Blood lipids; Fat, depot; Fatty acids; Liver fat; etc. Fats and oils absorption curves of, 96 analysis of, 101 butter fat, crystallization of, 106 of cacao butter, 106 of Calycanthus, 155 of cod liver, 304 vitamin content of, 326 of corn, 108, 309 nutritive value of, 225 of cottonseed, 97, 106 polymorphism of, 105 x-ray diffraction characteristics of, 105 epoxidized oils, 104 esters of, separation of, 94 of fish liver, vitamin A content of, formation of by yeast, 456 glyceride structure of, 105 of hipseed, 108

of linseed, 94

flavor reversion in, 99

Fats and oils (cont.) of margarine, nutritive value of, 225 menhaden, 101 of milk fatty acid analysis of, 107 glyceride structure of, 105 nutritive values of, 225 olive oil absorption of, 220, 230 hydrolysis of, 61 of peanuts, 97, 101 pig-back fat, 106 of rape, 103 of sesame, 101 pyrethrin activation of, 565 of soybean, 97 nutritive value of, 225 stability of, 105 sterol content of, 155 vitamin E fraction of, 276 spectrophotometric examination of, 99 sterculia oil, 102 stillingia oil, 108 of sunflower seed, 101 of tobacco seed, 97 glyceride structure of, 106 of tung, 98 vitamin requirement and, 309 of wheat germ fatty acid analyses of, 107 muscular dystrophy and, 281 sterol content of, 155 of wools, 102 see also Lipids; and Phospholipids Fatty acid metabolism, tricarboxylic acid cycle and, 17 Fatty acids absorption of, 220-21 absorption spectra of, 104 acetylcholine synthesis and, 240 activation of, 229 adsorption of, temperature and, 95 anteiso acids, 102 bacterial growth and, 229 binary mixtures of estimation by spectrophotometric method, 95 separation by chromatographic adsorption, 94-95 solidification points of, 101, 102 solubility of, 102 of butter, nutritive value of, 303 conjugated, detection of, 97 dehydrogenases of, 219 derivatives of, oxidation of, 15-17 determination of in blood, 219 essential, 231-32 esterification of, 105 excretion of, 220-21 fractionation of, 219

Fatty acids (cont.) growth and, 234 interconversion of, 491 iodine values of, 100 isomerization of, 97 liver metabolism and, 233 oxidation of, 15, 103, 195 adenosinetriphosphate and, 24 intermediaries in, 235 in liver, 236 liver suspensions and, 16 respiratory quotient and, 200-201 spectrophotometric studies of, 104 tricarboxylic acid cycle and, 15 reduction of by yeast, 455-56 saturated, absorption spectra of, 99 separation of, 93 chromatographic method of, 94 low temperature crystallization and, 100 structure of, fat deposition and, 234 synthesis of, 224-25 from acetic acid, 237 alloxan diabetes and, 197 carbohydrate diet and, 197 cystine feeding and, 223 ultraviolet absorption of, 99 unsaturated, epoxy compounds of, 104 utilization of, tocopherol and, 231 see also Fat metabolism; Fats and oils; and specific substances Fecosterol, isolation of from yeast, 442 Fermentations bacterial, iron and, 483 coenzyme destruction in, 199 enzymes and, 445-46 of nitrogenous compounds, 491-93 of non-nitrogenous compounds, 489rate of, nicotinamide and, 200 Ferrimyoglobin, spectrophotometric characteristics of, 121 Fetuin isolation of, 122 molecular weight of, 129 properties of, 122 Fibrin antigenicity of, 518 clotting of calcium and, 39 thrombin and, 39 degradation of, proteolytic, 40 formation of, 46-47 hydrolysis of, 37 immunological specificity of, 518 production of, 14 Fibrinogen

antigenicity of, 518

degradation of, proteolytic, 40

fibrin formation from, 46

Fibrinogen (cont.) hydrolysis of, 36 immunological specificity of, 518 in plasma, 266 polarographic analysis of, 46 see also Blood, clotting of Fibrinolysin action of, 41 inactivation of, 40 streptococcal, 39-41 zymogen activation by, 40 Fibroin hydration of, 135 soluble, preparation of, 132 Flavoproteins, 5-6 activity of, 13 denaturation of, 443 isolation of, 443 see also specific substances Fluoride bacterial activity and, 369 blood composition and, 211 deaminase inactivation and, 492 dental caries and, 368-69 enzyme inhibition by, 11, 211 lactate utilization and, 491 photosynthesis and, 402 pyruvate formation and, 420 pyruvate reduction and, 491 yeast metabolism and, 437 Fluorine anemia and, 365 enamel acid solubility and, 368 tooth formation and, 364 uptake by teeth, 364 Folic acid antipernicious anemia activity of, 284 availability of, 291 bacterial growth and, 387-88 determination of, 318 excretion of, 284 growth and, 264 hemoglobin formation and, 251 leukocyte count and, 301 neoplasm regression and, 291 in sweat, environmental conditions and, 284 Formaldehyde adrenotropic hormone activity and, 348 antibodies and, 514 gramicidin toxicity and, 146 protein hydration and, 135 Formate, formation from pyruvate, 487 Formic acid, in grape juice, 455 Fructosan, in plants, 419 Fructose in blood, hepatitis and, 212 color reaction with tryptophane, 440 Fructose (cont.) phosphorylation of, 201 in plants, 418 Fructose diphosphate, fermentation of, 453 Fructose-1,6-diphosphate, preparation of from bakers' yeast, 449 Fructose-1,6-diphosphoric acid, alkaline earth salts of, 449 Fructose-1-phosphate, formation of in liver, 199 Fructose-6-phosphate, transphosphorylation of, 453 Fructosides, formation of, 498 Fumarase, crystallization of, 67 Fumaric acid formation of, 597 oxidation of, bacterial, 479 in plants, 427 biotin requirement of, 376 nutritional requirements of, 387 spore germination, 445 Furanosides, phosphorylation of in plants, 419 Fusel oil, formation of, 455 Fuxoxanthin, photosynthesis and, 408 Galactopyranose-1-monophosphate, 450 Galactose fermentation of, 450 enzymes and, 466 utilization of, fat feeding and, 240 d-Galactose, phosphorylation of, 450 Galactose monophosphoric acid, 450 Galactozymase, 466 Gallic acid, oxidation of, 424 Gamma globulin anticomplementary properties of, 518 measles and, 514 mobility of, 517 Gammexane, 558 toxicity of, 564 Gastrin, activity of, 354 Gelatin amino acid composition of, 125 proteolytic degradation of, 40 specific volume of, change in, 136 Genes, adaptation and, 199

amino acid composition of, 125

deficiency of, porphyrin synthesis and,

electrophoretic examination of, 142

partial specific volume of, 130

growth and, 255

denatured, 506

Globulin (cont.) immunization and increase in, 508 molecular weight of, 129 Glucolipids, immunological properties of, 110 Glucosan, formation of, 499 Glucose aerobic decomposition of, 452 assimilation of, 481 bacterial fermentation of, 477 of blood blood lipids and, 222 determination of, 212 formation of, enzyme control of, hyperglycemia, 204, 211, 233 hypoglycemia, 210 diabetic acidosis and, 240 esterification of, 420 fermentation of cinchophen and, 458 products of, 490 by yeast, 466 lactate formation from, 490 liver metabolism and, 233 oxidation of by brain, amphetamine and, 595 chloretone and, 482 citrinin and, 12 phosphorylation of, 25, 51, 201 in plants, 418 tolerance to alloxan and, 206 gastroenterostomy and, 211 utilization of bacterial, 481 by yeast, 444 yeast fermentation and, 436 see also Carbohydrate metabolism d-Glucose, glycosides of, 176 Glucose oxidase, 6, 423 Glucoside, preparation of, 163 Glutamate, pyruvate oxidation and, 480 Glutamic acid bacterial fermentation of, 491 bioassay of, 123, 124 deamination of, 23, 497 determination of, enzymic, 57 growth and, 263 in insulin, 353 intravenous injection of, vomiting produced by, 251 oxidation of, 483 caffeic acid and, 424 racemization of, 124 synthesis of, 258 d-Glutamic acid, in tumors, 260 Glutamine, bacterial growth and, 389 Glutathione

cytochrome inhibition by, 608

ons

Gliadin

Globulin

187

140

Gonadotropins

Glutathione (cont.) decomposition of, 492 dehydroascorbic acid reduction by, enzyme reactivation by, 12 oxidation of, 259 plant respiration and, 427 Glutathione oxidase, 10 Gluten, fractionation of, 122 Glyceraldehyde dehydrogenation of, 597 epinephrine inactivation by, 602 Glyceraldehydephosphate, phosphate fixation by, 439 Glycerides, 105-8 crystallization of, 106 dilatometry of, 105 growth and, 225 in milk fat, 106 naturally occurring, 106-8 in salmon roe, 108-9 synthetic, 105-6 physical properties of, 105 polymorphism of, 105 see also Fats and oils Glycerol fermentation of, bacterial, 489 formation of, 448-49 oxidation products of, 481 utilization of, 489 Glycerophosphates hydrolysis of, 459 oxidation of, 489 Glycine, 258 bacterial fermentation of, 491 bioassay of, 123 deamination of, 599 growth and, 263 oxidation of, caffeic acid and, 424 Glycogen deposition of, adrenalectomy and, 354 in liver, 195 synthesis of, 84 tooth calcification and, 362 Glycoleucine, analysis of, 126 Glycollic acid desulfurase inactivation by, 47 oxidation of in plants, 427 Glycosides cardiac, 164-80 constitution and activity of, 175-77 from natural sources, 164-66 natural, structure and transformations of, 166-75 purification of, 165 sterol, 163-64 preparation of, 163 synthetic, 175-80

production of, 177-80 Glyoxalase, inhibition of, 428

adrenal cholesterol and, 112 denaturation of, 350 by urea, 133 inactivation of, 350 Gonads, adrenotropic hormone and, 349 Gramicidin hydrolysis of, 145 toxicity of, 146 Grape juice, fermentation products of, 464 Growth amino acids essential for, 263 dietary fat and, 225-26 globin and, 255 histidine and, 257 niacin and, 306 pyridoxal and, 279 pyridoxine deficiency and, 307 riboflavin deficiency and, 306 vitamin A and, 302 Growth factors bacterial decomposition of, 483 strepogenin, 264 Guanidine, protein denaturation by, 142 Guanidoacetic acid, methylation of, 265 Guanine analogues of, 386 bacterial growth and, 386 coenzyme-like action of, 51 formation of, 51, 199 Guanosine, 386

H

Heart

arrhythmias, thiamine deficiency and, cardiovascular capacity, vitamin B deficiency and, 298 cytochrome-c content of, 425 glycogen in, blood ketone levels and, hemorrhages of, DDT and, 557 ketone body utilization by, 239 myocarditis, choline deficiency and, 308 phospholipids in, 108 phosphorylase activity of, 50 tyramine deamination by, 604 Hellebrin absorption spectra of, 175 cardiac activity of, 174 cleavage of, 174-75 structure of, 174 Hemagglutinins, 516 Hematin, bacterial growth and, 378 Hemin, catalase activity of, 3 Hemipyocyanine, fungistatic effect of,

SUBJECT INDEX

Hemocyanin composition of, 128 dissociation of, 128-29 electron microscope studies of, 128 Hemoglobin crystalline, 121 denaturation of, rate of, 132 formation of amino acids and, 251 folic acid and, 251 hydration value of, 135 isoleucine content of, 255 prosthetic group of, excretion of, 251 pyruvate utilization and, 480 specific volume of, 137 synthesis of, 250-51 Hemolysin activity of, 13 from cobra venom, 121 properties of, 121 Hemorrhage, hypervitaminosis A and, 302 Heparin, trypsin activity and, 37 Hesperidin, capillary resistance and, Hetero-Δ1-ketones, 160-61 formation of, 160 structure of, 161 Hexachlorocyclohexane insecticidal action of, 558 isomers of, 558 stability of, 558 Hexadecatrienoic acid, bromination of, Hexokinase activity of, 13, 198 crystalline, preparation of, 199 inactivation of, 51 in muscle, 51 Hexosediphosphate dephosphorylation of, 438 fermentation of, 452 Hexose-1,6-diphosphate, decomposition of, 420 Hexosephosphates, plant respiration and, 420 Hexylresorcinol, trypsin activity and, 37 Histamine anaphylaxis and, 529 immune reactions and, 529 uterine contraction and, 529 Histidase, 45 activity of, 256 pH and, 45 Histidine analysis of, colorimetric, 124 bacterial fermentation, 491 bioassay of, 123, 124 deficiency of, nitrogen balance and,

49

of,

65

nd.

nd.

nd.

of,

Histidine (cont.) determination of, enzymic, 57 growth and, 257, 263 in hypertensin, 355 reaction with formaldehyde, 146 weight maintenance and, 257 in yeast, 444 d-Histidine, excretion of, 257 Homocysteine, desulfurase activity and, 47 Hordenine deamination of, 594 oxidation of, 600 Hormones, 347-60 of the gastrointestinal tract, 354 tooth structure and, 366 see also individual glands and specific hormones Hydnocarpic acid absorption spectrum of, 103 preparation of, 103 Hydrazine, decarboxylase inhibition by, Hydrogen cyanide, insecticidal action of, Hydrogen ion concentration adenylpyrophosphatase stability and, 452 arginase activation and, 44 bacterial glucose assimilation and, 482 bacterial growth and, 490 blood clotting and, 46 cholesterol degradation and, 164 citrate fermentation and, 490 decarboxylase activity and, 496 fluorescence and, 406 histidase activity and, 45 photosynthesis and, 406 protein stability and, 120 rennin proteolytic activity and, 120 uric acid oxidation and, 9 virus stability and, 581 Hydrogen peroxide catalase activity and, 3 catalytic decomposition of by chloroplasts, 402 Hydroquinone, pyrethrum activity and, 544 Hydroxybenzoic acid, epinephrine oxidation and, 598 5-Hydroxycholestane, formation of, 158 17-Hydroxycorticosterone, glycosuria and, 206-7 Hydroxylamine bacterial fluorescence and, 407 photosynthesis and, 402, 411 m-Hydroxyphenethylamine, oxidation of, 600 Hydroxyquinoline, ascorbic oxidase activity and, 427

Hypertensin, purification of, 355 Hypertensinase, inhibition of, 355 Hypertensinogen, 355 preparation of, 355 Hypertension, clinical, eclampsia and, 58 Hypertension, experimental amine inactivation and, 603 epinephrine and, 597 iodoadrenochrome and, 609 kidney cytochrome oxidase activity and, 11 perinephritic, tyrosinase and, 604 renal factors in, 354 renal ischemia and, 604 Hypoxanthine analogues of, 386 bacterial growth and, 386 Iminazoles, deamination of, ascorbic acid and, 601 Immunochemistry, 505-38 of cottonseed hypersensitivity, 525 immune reactions, 527-30 histamine and, 529

immunochemistry, 303-38
of cottonseed hypersensitivity, 525
immune reactions, 527-30
histamine and, 529
isoimmunization, 519
passive sensitization, 512
protein denaturation and, 512
quantitative methods of study in, 50512
Immunology, chemical constitution and

immunological specificity, 507 Inanition, serum lipids and, 110 Indigotetrasulphonate, 422 Infectious mononucleosis, 516 Inosine, hypoxanthine liberation from,

Inosine, hypoxanthine liberation from, 50
Inositol deficiency of, poliomyelitis susceptibil-

ity and, 309 lipotropic action of, 233 tocopherol utilization and, 281 in yeast, 442

Insecticides, organic, 539-72 action of, 561-66 on enzyme systems, 562

mechanism of, 561 neurohistopathological changes and, 562

synergistic, 564-65 tests for, 565 application of, 559-61 aerosol, 559

in smoke, 559 toxicity and, 563 of plant origin, 539-49 from *Derris*, 544-47

from Lonchocarpus, 546, 547 nicotine, 539

Insecticides, organic (cont.)
of plant origin (cont.)
from Pachyrrhizus, 549
pyrethrins, 542-44

synthetic, 549-59 cyanides, 550 DDT, 552-58

dinitrophenol derivatives, 551 thiocyanates, 551-52

toxicity of application and, 563

chemical constitution and, 563 molecular configuration and, 564

Insulin amino acid content of, 125, 353 assay of, 353

carbohydrate metabolism and, 209-10 crystalline, optical crystallographic

properties of, 352 free amino groups of, location of, 143-44

glycogen synthesis and, 197 hexokinase inactivation and, 51 hypoglycemia and, 210 inactivation of, 352 ketonuria and, 210

ketosis and, 239 liver metabolism and, 233 molecular weight of, 126, 136 in pancreas, 353

respiratory quotient and, 210 sensitivity of, hypophysectomy and, 209

structure of, 126 water in crystals of, 138 Intestine, small

absorption from of amphetamine, 605 of DDT, 556 of fat, 61 of olive oil, 230

of thiamine, 282 enzyme activity of, 61

monoamine oxidase activity of, 603 phospholipids of, 109

Inulin storage of in plants, 89 synthesis of, 89 Invertase, in plants, 419

Iodine adrenotropic hormone activity and, 348

arginase destruction by, 44 Iodoacetate

blood composition and, 211 dental caries and, 369 enzyme inhibition by, 211, 228, 423, 428

plant respiration and, 428, 429

Ketone bodies

Iodoadrenochrome action of, 596 blood pressure in hypertension and, structure of, 596 Iron bacterial fermentations and, 483 bacterial glucose assimilation and. decarboxylase inhibition by, 55 metabolism of, tooth depigmentation and, 366 sugar fermentation and, 486 yeast fermentation and, 435 Isatin, 163 Isoamylamine, dissociation constant of, Isobutylundecylenamide, pyrethrin activation by, 565 Isocitrate, oxidation of to succinate, 196 Isocitric acid biological oxidation of, 6 oxidation of, 194 in plants, 427 Isocysteine, decomposition of, 492 Isoergosterol, 442 Isoleucine, 255-56 bioassay of, 123 deamination of, 496-97 deficiency of anemia and, 255 nitrogen balance and, 251 growth and, 255, 263 hematopoiesis and, 256 in hemoglobin, 255 pyruvate utilization and, 480 in yeast, 444 Isopropyl alcohol, formation from acetate, 484 Isopropylamine, 595

J

Jervine, cleavage products of, 186

Isoserine, bacterial growth and, 382

Isorubijervine, 186

K

Kala-azar, cold hemagglutinins in serum, 516
Kaolin, thiamine availability and, 282
Keratin
amino acid analysis of, 124
elasticity of fibers of, 127
x-ray diffraction pattern of, 129
Ketene, enzyme inactivation by, 37
α-Ketoglutarate, amino acid deamination and, 23
α-Ketoglutaric acid, formation of, 279
Ketols, condensation of, 462

determination of in blood, 220 distribution of, 239 formation of, 238, 239 ketosis, 239-40 hunger and, 240 utilization of, 239 Ketones ketosis, vitamin A deficiency and, 303 unsaturated, 160 Kidney, 354-55 absorption by of fats, 220 of glycine, 265 acetate oxidation by, 238 arginase content of, steroid hormones and, 43 cortex, catheptic activity of, 42 cytochrome oxidase activity in, hypertension and, 11 desulfurase activity of, 48 excretion of DDT, 557 fat, 111, 220 fat resorption by, 111 function adrenalectomy and, 353 vitamin D and, 300 hypertrophy of coenzymes in, 12 pituitary gland and, 349 ischemic, hypertension and, 604 ketone body utilization by, 239 lesions of, serine and, 257 nephrosclerosis, desoxycorticosterone and, 348 nephrosis, choline deficiency and, 264 pepsinase activity of, 355 phosphatase activity of, 67 phospholipids of, adrenal insufficiency and, 233 renin-hypertensin system, 354-55 tyramine deamination by, 604 weight of, castration and, 43 Kynurenine, excretion of, pyridoxine deficiency and, 256

T.

Laccase, purification of, 4
Lactalbumin, choline equivalent of, 308
Lactate
bacterial fermentation of, 491
oxidation of
bacterial, 476
citrinin and, 12
reduction of, fluoride and, 230
synthesis of, 476
utilization of, fluoride and, 491
Lactation
diet and, 321

Lactation (cont.) dietary fat and, 232 plasma vitamin A and, 302 Lactic acid bacterial production of, 488-89 in blood, liver glycogen derived from, metabolism of in bacteria, 230 oxidation of, 427 enzyme systems in, 429 in plants, 422 production from glycerol, 489 see also Carbohydrate metabolism Lactoglobulin amino acid composition of, 126 analysis of, isotope dilution method, 124 dielectric properties of, 128 hydration value of, 135 molecular weight of, 126, 128 of crystals, 136 specific volume of, 137 water in crystals of, 138 Lactose, fermentation of, 445 Laminaridiosazon, 441 Lanosterol, constitution of, 442 Lanthanum, yeast fermentation and. 435 L. casei, fluorescence of, 278 L. casei factor, 292 bacterial growth and, 387-88 determination of, 318 Lead enamel solubility and, 368 yeast fermentation and, 435 Leaves, see under Plants Lecithin bacterial growth and, 229 in brain, 108 complement fixation tests with, 518 in heart, 108 hydrolysis of, 62, 109 in liver, 108, 223 purification of, 109 vitamin A storage and, 285 see also Phospholipids Lecithinase, 62 from cobra venom, 121 isoelectric point of, 121 molecular weight of, 121 Lethane, 384, 552 nervous system and, 562 Leucine bioassay of, 123 deamination of, 23 deficiency of, nitrogen balance and, dehydrogenation of, 493 growth and, 263 in insulin, 353

Leucine (cont.) pyruvate utilization and, 480 in veast, 444 d-Leucine, in hair, 260 dl-Leucine, preparation of, 255 Leucoadrenochrome, oxidation of, 597 Leukemia, fat in diet and, 226 Leukocytes count, folic acid and, 301 leukopenia, vitamin Be and, 292 lymphocytes antibody formation by, 516 protein storage in, 348 poikilocytosis, rumen fistulas and, 290 Levan in plants, 89-90 production of, bacterial, 498 synthesis of, 498-99 Levulan, synthesis of, bacterial, 203 Lewisite, 13 Light, Chlorella respiration and, 410-11 Linin, 122 Linoleic acid absorption coefficient of, 95, 105 autoxidation of, 104 bacterial growth and, 229 determination of, spectrographic, 97 identification of, 98 synthesis of, 231 ultraviolet absorption of, 99 Linolenate, liver metabolism and, 233 Linolenic acid absorption coefficients of, 95 bacterial growth and, 229 determination of hexabromide test for, 100 spectrographic, 97 identification of, 98 purification of, 104 in sovbean oil. 97 synthesis of, 231 ultraviolet absorption of, 99 Lipase, 61-62 Lipids, 93-118 of blood celiac syndrome and, 110 fractional determinations of, 110 inanition and, 110 rheumatoid arthritis, gold salt therapy and, 110 tuberculosis and, 110 water deprivation and, 110 cardiolipin, preparation of, 109 determination of, 219 in diet, lactation and, 232 extraction of, 109-10 from tissues, 62 growth and, 225-26 iodine numbers of, 113 isomerization of, 97

Lipids (cont.) of liver cell nuclei, 110 phosphorus of, 108 spectrophotometric studies of, 105 synthesis of from carbohydrates, 224 diabetes and, 225 from protein, 224 pyruvic acid and, 237 of tissues, 109-13 determination of, 110 in viruses, 579, 580 of yeast, extraction of, 109 see also Cerebrosides: Fats and oils: Fat metabolism; Phospholipids; etc. Lipocaic, lipotropic action of, 232 Lipoproteins linkages in. 93 preparation of, 93 Lipoxidase activity of. 9 preparation of, 9 purification of, 227 Lithium, yeast fermentation and, 435 amphetamine degradation by, 606 arginase content of, 44 catalase activity of, 3 choline in, 315 codecarboxylase content of, pyridoxine in diet and, 57 cytochrome oxidase activity in, 10 damage to, DDT and, 557 desulfurase activity of, 47 epinephrine inactivation by, 607 fat content of, 223-24, 234 adrenalectomy and, 109 butter yellow and, 223 inositol and, 232 fat metabolism in, 233 fatty infiltration of, 223 biotin and, 232 casein and, 308 cephalin in, 109 choline deficiency and, 223, 231 cystine feeding and, 223 pancreatectomy and, 232 plasma choline and, 292 tuberculosis and, 111 amphetamine excretion and, 605 carbon tetrachloride and, 605 choline deficiency and, 308 glycogen content of, 195, 197, 234 hepatectomy, hyperglycemia after alloxan injection and, 204 hepatitis, blood fructose and, 212 ketone body formation in, 238, 239 lipase activity of, 227 metabolic pattern of, diet and, 223

290

97

ra-

Liver (cont.) monoamine oxidase activity of, 603 phosphate turnover in, 223 phospholipids of, 108, 109 adrenal insufficiency and, 233 choline and, 220 phosphorylase activity of, 50, 201 protein deficiency and, 263 respiratory quotient of, 234 fatty acids and, 233 telangiectasis and, 285 tumors of, phospholipid in, 223 tyramine deamination by, 593, 604 urea synthesis by, thiamine deficiency and. 44 vitamin A storage in, 231, 303 Luciferase, action of, 494 Luciferin action of, 25 oxidation of, 494 Lumichrome, production of, 483 injury to, DDT and, 557 lipid content of, 225 monoamine oxidase activity of, 603 Lycopene, 275, 284, 323 Lymph antibody content of, 517 from burns, peptidase activity of, 39 Lymphatic system, 348 lymphoid tissue adrenocorticotropic hormone and, antibody release from, 348 serum globulin release from, 348 Lymph nodes, antibody formation in, 516 Lysine, 259 arginase inactivation by, 42 bioassay of, 123, 124 decarboxylation of, 252 deficiency of anemia and, 259 hypoproteinemia and, 259 weight maintenance and, 259 in yeast, 444 1-Lysine, determination of, enzymic, 57 Lysozyme activity of, 13 crystalline, 120 isoelectric point of, 120 isolation of, 120 molecular weight of, 120 purification of, 120, 121 vitamin liberation and, 587

Magnesium deficiency of, dentin formation and, Magnesium (cont.)

yeast fermentation and, 435

Malaccol insecticidal action of, 545 structure of, 545 Malaria control of, DDT and, 555 false syphilis serological test with, 513 immunity in, 505 Malate, plant respiration and, 428 Maleic acid formation of, 597 oxidation of, bacterial, 479 Malic acid oxidation of, bacterial, 479 in plants, 427 Malonate blood composition and, 211 enzyme inhibition by, 211 Malonic acid enzyme inhibition by, 10 succinic acid dehydrogenation and, Malt amylases in, determination of, 61 diastatic power of, 61 Maltase bacterial, 497 pH optima of, 497 specificity of, 497 Maltose

phosphorylation of, 419 Maltoside, preparation of, 163 Mammary gland, fat metabolism in, 224 Mandelic acid bacterial growth inhibition by, 382 oxidation of, 5 Manganese enamel formation and, 365 yeast fermentation and, 435 Mangoes, ascorbic acid content of, 322 Mannan isolation of from yeast, 441 structure of, 441 Mannose, fermentation of by yeast, 466 Marinobufagin acetylation of, 177 cardiac activity of, 177 Measles, gamma globulin and, 514 Melanin

fermentation of, 448

Melibiose, utilization of, bacterial, 482 Meningococcus, carbon dioxide requirement of, 479

2,3-Mercartopropanol brain glycolysis and, 14 lewisite action and, 14

formation of, 424-25

precipitation of, 597

2.3-Mercartopropanol (cont.) methemoglobin reduction by, 14 urinary arsenic excretion and, 14 Mercury carbohydrate metabolism and, 435 yeast respiration and, 436 Mescaline detoxication of, 604 excretion of, 604 Mescaline oxidase, 11 Metakentrin, 518 Metaphosphatase, action of, 460 Methane formation of, kinetics of, 478 synthesis of, 477 Methemoglobin molecular weights of crystals, 136 reduction of, 2,3-mercartopropanol and, 14 water in crystals of, 138 Methionine bioassay of, 13

Methionine
bioassay of, 13
deficiency of, 308
lipotropic action of, 233
prevention of fatty infiltration of liver
by, 232
synthesis of in vivo, 264
in yeast, 444
see also Amino acid metabolism
Methylamine, formation of, 594
Methyl arachidonate, absorption spectra
of, 105
2-Methyl-1,4-naphthoquinone, antibacterial action of, 14
Methylnicotinamide
assay of, 315

Methyl oleate, oxidation of, 103
Methylphenylnitrosoamine, pyrethrin activation by, 566
Methylxanthines, plasma fibrinogen and, 265-66
Mexicain, crystallization of, 35, 67
Microorganisms
adaptation of, 391
growth of
alanine and, 386

excretion of, 315

biotin and, 376-78

choline and, 378
cozymase and, 378-80
diphosphopyridine nucleotide and,
379
factors for, 375-96
hematin and, 378
inhibition of, 386
nicotinamide and, 378-80
nicotinic acid and, 378-80
pantothenic acid and, 380-82
purines and, 386-87
pyrimidines and, 386-87

Microorganisms (cont.) growth of (cont.) riboflavin and, 382-83 thiamine and, 383 thiouracil and, 387 triphosphopyridine nucleotide and, 380 unidentified factors for, 387-89 vitamin Be and, 383-86 mutants of, 390-91 synthesis of growth factors by, 391 Microscope, electron dental studies with, 370 protein studies with, 128 virus studies, 128, 579 Mille ascorbic acid content of, 314 carotene content of, 320 lipolysis in, 224 vitamin A in, 297, 320 vitamin D in, 280 vitamin content of, 319-21 pasteurization and, 325 Milk fat, 224 composition of, 224 fractionation of, 226 Mineral metabolism tooth formation and, 363-65 see also specific substances Molybdenum, yeast growth and, 436 Monoamine oxidase, 594 amine inactivation by, 603 distribution of, 603 Monochloroacetonitrile, insecticidal action of, 550 Muscle cholinesterase in, 65 codecarboxylase content of, pyridoxine in diet and, 57 dehydrogenase activity of, 67, 121 dystrophy of cholinesterase level and, 66 creatinuria and, 281 vitamin E deficiency and, 66 glycogen in, pituitary factor and, 208 metabolism of hexokinase reaction in, 198 insulin and, 209 lactic acid cycle in, 197 phospholipids of, 109 adrenal insufficiency and, 233 phosphorylases of, 48, 82 phosphorylation in, adrenalectomy and, 206

pigment in, vitamin E deficiency and,

protein interaction in, 119 resting, phosphorylase content of,

tyramine deamination by, 604

nol

ver

etra

cte-

ac-

ind,

and.

Muscle, cardiac, fatty degeneration of, 227 Muscular contraction molecular theory of, 120 vitamin content and, 321 Muscular endurance, vitamin B deficiency of, 298 Muscular exercise phosphate turnover and, 198 phosphorylase inactivation during, 49 Mushrooms catecholase activity of, 600 cresolase activity of, 600 Mycocerosic acid, 103 Myoglobin crystalline, 121 synthesis of, 121 Myosin crystalline adenosinetriphosphatase activity of, properties of, 119-20 hydrolysis of, 36 isolation of, 119 in muscle, 119

N

Neonicotine insecticidal action of, 540 structure of, 540 synthesis of, 540 Neoplasms Brown-pearce tumors, 519 butter yellow and, 111 cytochrome oxidase system in, 1 fat content of, 226 fat metabolism and, 226-27 d-glutamic acid in, 260 lipid content of, 112 regression of, 519 folic acid and, 291 spontaneous, fat in diet and, 226 Neosterol, isolation of from yeast, 442 cholinesterase activity of, 64, 65 degeneration of, pantothenic acid deficiency and, 309 Nervous system, central acetylcholine activity in, 67 amphetamine in, 606 lipids of, 111, 224 Neurosbora amino acid assay with, 123 carboxylase activity of, 421 mutants of, 378, 390 Niacin in coffee, 332 deficiency of corn as an etiological factor, 307

Nitrous acid (cont.)

Niacin (cont.) nicotinamide excretion and, 283 pellagra and, 301 destruction in man, 301 growth and, 306 in leguminous seeds, 324 in meat, 321, 324 processing and, 326 in milk, 321 requirement for, corn in diet and, 307 stability of in beer, 331 in vegetables, 324 processing and, 329 Nickel, yeast fermentation and, 435 Nicotinamide availability of, 379 bacterial growth and, 378-80 coenzyme protection by, 200 determination of, 317 fermentation rate and, 200 metabolism of, 278 methylation of by liver, 290 synthesis of in digestive tract, 283 see also Nicotinic acid Nicotine double salts of, 540 insecticidal action of, 539 nervous system and, 562 site of formation of in plants, 541 Nicotinic acid bacterial growth and, 378-80 determination of, microbiological method for, 317 excretion of, environmental conditions and, 283 in feces, 293 metabolism of, 283 in sweat, 283 synthesis of, 290, 293 bacterial, 483 yeast requirement for, 379 Ninhydrin agglutinin activity and, 514 antibodies and, 514 Nipecotic acid, biological activity of, 306 Nitrogen ascorbic acid conservation and, 313 plant respiration and, 417 in yeast, 444 Nitrogen balance burns and, 263 high-protein diet and, 263 histidine deficiency and, 257 infection and, 263 leucine deficiency and, 251 tryptophane deficiency and, 256 Nitrous acid adrenotropic hormone activity and,

amylase inactivation by, 60 enzyme inactivation by, 37 Norleucine, 255 Nornicotine insecticidal action of, 541 isomers of, 541 occurrence of, 540-41 site of formation of in plants, 541 structure of, 540 Notatin, 423 properties of, 6 Nucleic acid enzymatic synthesis of, 203 see also Desoxyribonucleic acid and Ribonucleic acid Nucleoproteins artificial, 130 denaturation of, 11 polymerization of, 11 virus, 574, 579 virus production from, 11 Nucleosides degradation of, 50 synthesis of, 50 Nucleotides colorimetric determination of, 212 enzymatic synthesis of, 203 Nutrition, 263-65 antibody formation and, 505 interrelations in, 309 of protozoa, 390 vitamins and, 295-311 Nutritional requirements for amino acids, 375 for ascorbic acid, 299 caloric, temperature and, 305 for carotene, 298 of dairy cattle, 301 of insects, 311 of lactic acid bacteria, 310 of microorganisms, 375-96 for niacin, 307 for pantothenic acid, 307 of poultry, 301 of protozoa, 390 for riboflavin, 306, 382-83 standards of, recommended dietary allowances, 295-97 of swine, 301 for thiamine, 299, 390 for vitamin A, 298, 303 for vitamin B complex, 298-99 for vitamins, 375 of yeast, 436 Nutritional state conjunctivitis and, 298 malnutrition, 296 surveys of, 296, 297

Nutritional state (cont.) undernutrition, causes of, 296 vitamin deficiencies and, 297 Nutritive value, of butter, 303 Nylon, water absorption of, 138

О

Octadecenoic acids, isolation of, 221
Oleandrin, cardiac activity of, 177
Oleate, liver metabolism and, 233
Oleate oxidase, activity of, 13
Oleic acid
autoxidation products of, 104
bacterial growth and, 229
preparation of, 103
ultraviolet absorption of, 99
Oleic oxidase, activity of, 13
Oleyldistearins, composition of, 106
Omentum, ketone body utilization by, 239

Ornithine, 258-59 arginase inactivation by, 42 bioassay of, 124 decarboxylation of, 252 determination of, enzymic, 57 urea formation and, 262

Ouabain cardiac activity of, 168, 176 cleavage of, 170 dehydrogenation of, 170

structure of, 167 Oxaloacetate

nd

ary

condensation of, 235 decarboxylation of, 478 formation of, 194 interaction with acetoacetate, 236 oxidation of, bacterial, 480 Oxaloacetic acid, oxidation of, 9 Oxaloacetic oxidase, 9-10

Oxaloacetic oxidase, 9-10 Oxalosuccinate

decomposition of, 19 formation of, 194 Oxalosuccinic acid, decarboxylation of,

54 Oxidases, phenol, 3-4

Oxidation-reduction potentials, enzyme activity and, 37 Oxidation-reductions, 1-34, 445

coupled reactions, phosphate transfer and, 50 dihydrocozymase and, 50

dihydrocozymase and, 50 mechanisms of, bacterial, 476-77 pyridine nucleotide systems, 6-8 "surface catalysts," 11

tricarboxylic acid cycle, 15, 16 fatty acid metabolism and, 17 Oxidations

anaerobic, 429 bacterial, 12 glycolysis and, 428-30 Oxidations (cont.) kinetics of, 8

phosphorylations and, 23-25 Oxybiotin

estimation of, 318 stability of, 318 dl-Oxybiotin, activity of, 280

11-Oxycorticoids, 354 Oxygen deficiency

ascorbic acid in urine and, 287 brain phosphocreatine and, 25 fat absorption and, 220

resistance to

adrenotropic hormone and, 348 tocopherols and, 287

tooth calcification and, 367 urine pH and, 287 Oxygen poisoning, 14-15

Oxygen pressure, tissue metabolism and, 26

Oxygen tension bacterial glucose assimilation and, 482 bacterial growth and, 385

Oxytocin, enzymes and, 351

P

Palmitate, liver metabolism and, 233 Pancreas amylase of, 61

carbohydrate metabolism and, 207-8 desulfurase activity of, 48

insulin content of, 353 pancreatectomy

alloxan diabetes and, 205 diabetes produced by, 352 glycosuria and, 205 insulin requirement and, 205 liver fatty infiltration and, 232

plasma choline and, 232 Pantothenic acid

analogues of, 381 bacterial growth and, 293, 380-82 bioassay of, 380

chemical analogues of, 293-94 deficiency of, 309

anemia and, 290, 366 nerve tissue degeneration and, 309 tooth depigmentation and, 366

excretion of, 290 environmental conditions and, 284

in meat, 321 metabolism of, 284 in milk, 321

requirement for, 307 synthesis of

bacterial, 294 salicylate and, 382

in tea, 332 in vegetables, processing and, 329 Pantoyltaurine, bacterial growth inhibition by, 381 Papain, activity of, 13 Parathormone osteoblastic activity and, 286 osteoclasis and, 286 Paraffine, utilization of, by yeast, 457 Pectins, bacterial cellulose decomposition and, 491 Pellagra, niacin deficiency and, 301 Penicillin action of, 14 blood clotting and, 47 virus infectivity and, 581 Pentoses, colorimetric determination of. 212 Pepsin activity of, 13, 524 hydration value of, 135 pituitary growth hormone and, 349 protein hydrolysis and, 37 Pepsinase, denaturation of, 355 Pepsitensin, inactivation of, 355 Peptides metabolism of, role of skin in, 265 synthesis of, 145-46 Peptones, 37-39 Peroxidase, 2 ascorbic acid oxidation and, 426 inactivation of, 2 properties of, 2 regeneration of, 2 Periplocymarin, isolation of, 165 Periplogenin, isolation of, 171 Personality, changes in, vitamin B deficiency and, 298 o-Phenanthroline, photosynthesis and, Phenol, virus infectivity and, 581 Phenolase, action of, 595 Phenethylamine blood pressure and, 603 degradation of, 603 Phenoloxidase, epinephrine oxidation by, 353 Phenylalanine bioassay of, 123 determination of, 124 growth and, 263, 265 pyruvate utilization and, 480 racemization of, 124 in yeast, 444 1-Phenylaminobutyric acid, acetylation of. 238 Phenylbutanolamine inactivation of, 607 structure of, 607

Phenylethanolamine, deamination of,

595

Phenylpropylamines, isomers of, deamination of, 595 Phlorhizin, glycosuria and, 212 Phosphatases, 458-64 acid, activity of, 13 activity of, adrenalectomy and, 220 alkaline crystallization of, 67 of kidney, 67 inhibition of, thiamine and, 459 in plants, 419 tooth calcification and, 362, 363 of yeast, 443 see also specific enzymes Phosphate bonds energy from, 25, 419, 480 fat metabolism and, 234 formation of, 223, 234 Phosphate transfer, 50, 194 dihydrocozymase and, 51 in muscle, insulin and, 198 Phosphates enzymatic synthesis and, 459 esterification of, 420 fixation of, 439 inorganic, fixation of, 25 pyruvate decarboxylation and, 457 pyruvate dissimilation and, 483 sucrose synthesis and, 87 yeast cell permeability to, 437 yeast requirement for, 438 Phosphocreatine in brain, anoxia and, Phosphoerythronic acid, formation of, Phosphofructokinase, activity of, 198 Phosphoglycerate in plants, 420 solubility of, 420 Phosphoglyceric acid, formation of, phosphate and, 457 d(+)2-Phosphoglyceric acid, synthesis of, 451 d(-)3-Phosphoglyceric acid preparation of, 451 synthesis of, 451 Phosphoglucomutase, activity of, 13 Phosphogluconic acid, fermentability of, 447 Phospholipase, 61-62 action of, 109 Phospholipids, 108-9 choline in, 223 choline-to-phosphorus ratios in, 223 determination of, 219-20 hydrolysis of, 109 iodine number determination, 220 in liver, 223

Phenylisocyanate, enzyme activity and.

SUBJECT INDEX

Phospholipids (cont.) oxidation of, 108 in plasma, 108 in salmon roe, 108-9 separation of, 222 synthesis of, 61 of tissues, 108-9, 222-23 adrenal insufficiency and, 233 turnover of, choline and, 222 see also Fat metabolism; Fats and oils: Lipids: and specific substances Phosphopyruvic acid, dephosphorylation of, 52, 439 Phosphorus radioactive, adsorption by teeth, 367 in viruses, 579 Phosphorylases, 419 activity of, 13, 49, 201, 418 alcoholic sugar fermentation and, 52 bacterial, 203 crystalline, 67, 201 disaccharide, 50 inactivation of, 48, 498 interconversion of, 48-49 in liver, 202 in muscle, 82 nucleoside, 50 in plants, 85 polysaccharide, 48-50 purification of, 49 specificity of, 49 Phosphorylation adenosinetriphosphate and, 51 adrenalectomy and, 206 bacterial, 482 biological, 52 in carbohydrate metabolism, 198 coupled reactions in, 455 dephosphorylation, 52 arsenate and, 438, 439 inhibition of, 428 kinetics of, 8 oxidations and, 23-25 oxidative, 453 in plant respiration, 419 in plants, 419 transphosphorylation, 450 see also Enzymes, phosphorylating; Phosphatases; and specific sub-Photosynthesis, 18-19, 397-416 by algae, Michaelis constant for, 478 anaerobic, in algae, 403 in bacteria, 397, 410 carbon dioxide absorption in, 404 carbon dioxide fixation in, 398 carbon dioxide pressure and, 412 chemistry of, 397

enzymatic reactions in, 195

enzyme systems in, 402

d,

nd.

ity

Photosynthesis (cont.) ethyl urethane and, 407 experimental techniques for study of, 411-12 fluorescence and, 404-8 fluorescence intensity-time curves, hydrogen donors for, 405, 406 hydrogen ion concentration and, 406 inhibition of, 411 kinetics of, 398 light intensity and, 412 measurement of gas exchange in, 412 nitrate assimilation and, 411 oxygen evolution in, 401-4 reaction velocity of, 402 oxygen liberation in, 398 phosphate esters and, 398, 411 plant pigments and, 408-9 poisons and, 402 products of, 411 quantum yields of, 398-401 rate of, hydrogen donor concentration and, 410 stages of, 413 temperature and, 412 Phthioic acid, from tubercle bacillus, 103 Physical fitness, vitamin B deficiency and, 298 Physostigmine, DDT activity and, 565 Phytophosphate, activity of, 460 Pigments, bacterial, 488 Piperine, insecticidal action of, 566 Pituitary gland adrenocorticotropic hormone, 348-49 acetylcholine synthesis and, 348 activity of, 348 anoxia resistance and, 348 glycosuria and, 207 lymphoid tissue and, 517 anterior lobe of diabetes and, 208, 347 growth hormone from, 265 hexokinase inactivation by, 353 ketogenic activity of, 240 liver fatty infiltration and, 224 nephrosclerosis and, 348 renotropic effect of, 349 basophil cells of, alloxan and, 206 carbohydrate metabolism and, 208-9 cholinesterase in, 65 corticotropic hormone of, adrenal cholesterol and, 112 extract of, diabetogenic effect of, 208 gonadotropic hormone of, 350 growth hormone of, 349 activity of, 349 amino acid composition of, 349 isoelectric point of, 123

Pituitary gland (cont.)

Plant respiration (cont.)

growth hormone of (cont.) isolation of, 122-23, 349 molecular weight of, 123 properties of, 349 stability of, 349 hypophysectomy adrenal cholesterol and, 111 adrenal function and, 209 hyperglycemia after liver injection and, 204 insulin sensitivity and, 209 tooth growth and, 366 insulotropic hormone of, 350 lactogenic hormone of, 347 activity of, 347 assay of preparations of, 347 viscosity of, 347 melanophore hormone of, 351 posterior lobe of, hormones of, 350thyrotropic hormone of, 347-48 activity of, 347 cytologic determination of, 348 Placenta lipoproteins of, 113 permeability of to alloxan, 205 Plant carbohydrates, 75-92 storage of, 75 synthesis of, 75 Plant metabolism alcohol formation, 421-22 carbon dioxide output, acetaldehyde and, 429-30 glycolysis, products of, 428 hydrogen transfer in, 427 virus infections and, 586 vitamin K₁ and, 276
see also Plant nutrition and Plant respiration Plant respiration, 417-34 aerobic, 417 anaerobic, alcohol fermentation in, 422 carbohydrate, caffeic acid and, 424

carbohydrate translocation in, 419

carbon dioxide exchange in, 428

energy production from, 419

oxidation and, 428-30

iodoacetate and, 428, 429

sugar complexes, 418-19

oxidation mechanisms, 422-28

ascorbic oxidase, 426-27

catechol oxidase, 423-25

cytochrome oxidase, 425-26

enzymes and, 423

furanose and, 419

glycolysis, 418-22

light and, 410-11

glutathione and, 427

oxidation mechanisms (cont.) dehydrogenases, 422-23 dicarboxylic acid cycle, 427-28 tricarboxylic acid cycle, 427-28 oxygen exchange in, 428 phosphorylation cycle in, 419-21 poisoning of, 426 products of, 418 rate of carbohydrate content and, 417 citrate and, 428 hexosephosphates and, 420 malachite green and, 422 malate and, 428 nitrogen content and, 417 phosphate and, 420 pyruvic acid and, 421 starvation and, 420 succinate and, 428 see also Plant metabolism Plants alkaloid synthesis in, 541 ascorbic acid content of, 426 carboxylase activity of, 421 catechol oxidase activity of, 425 citric acid content of, 427 cytochrome content of, 425 dehydrogenase content of, 422, 427 enzyme activity of, 419 fluorescence of, pH and, 406 fructose content of, 418 fruits acetaldehyde content of, 421 fructopyranose accumulation in. 418 glucose content of, 418 lactic acid content of, 422 leaves of, sucrose respiration in, 418 malic acid content of, 427 nitrate assimilation, photosynthesis and, 411 phosphate esterification in, 420 phosphorylation in, 419 photoperiodism in, chlorophyll and, 409 pigments of, photosynthesis and, 408-9 proteins of, 121 separation of, 121 pyruvate formation in, 420 riboflavin content of, 423 rotenone distribution in, 547 seeds, fat content of, 418 starch content of, 418 sucrose content of, 418 sucrose synthesis by, 50 tobacco, alkaloid content of, 541 virus infections of, 585 zymohexase content of, 420

Plasma ascorbic acid content of, 314 carotene in, 280 choline in, 315 deproteinization of, 212 electrophoretic pattern of, 143 fractionation, by-products of, 514 lipids of, tuberculosis and, 110 phosphate content of, alloxan and, 206 phospholipids in, 108 vitamin A in, 302 Plasma proteins, 250-51 nutritive value of, 263 production of depletion and, 251 after plasmapheresis, 251 tryptophane deficiency and, 251 substitutes for, 250 synthesis of, half-life time for, 250 see also Serum proteins Pneumococci, choline requirement of, 378 Pneumonia, sulfonamides and, 515 Poison ivy, toxicity of, oxidation and, 4 Poliomyelitis brain glycolytic activity and, 200 resistance to, vitamin deficiencies and, 231, 305, 309 Polyphenol oxidase, activity of, 13 Polysaccharides bacterial cellulose decomposition and, 491 capsular, 499 differentiation of, 202 enzymatic synthesis of, 201 molecular constitution and, 202 glycolysis of in plants, 420 immunological activity of, 525 isolation of, 441 molecular constitution of, 202 in serum, 509 structure of, branched, 202 synthesis of, 49 from yeast, 441 see also specific substances Porphyrins excretion of, low-protein diet and, 258 formation of, 443 iron synthesis of, 493 utilization of, 493 Potassium, yeast fermentation and, 435, Potassium bromate, yeast proteolysis

and, 454

and, 454

Potassium ethyl xanthate, ascorbic oxidase activity and, 427

Potassium manganate, yeast proteolysis

Pregnancy biotin and, 291 corneal vascularization and, 300 glossitis and, 300 resorption termination of, vitamin E deficiency and, 287 thiamine excretion and, 300 Progesterone, side-chain configuration in, 163 Proline, 258-59 bioassay of, 123 Propadrine deamination and, 601 inactivation of in vivo, 606 Propionate, synthesis of, 476 Propionylcholine, hydrolysis of, 64 Prostate gland lipids of, 112 metabolism of, castration and, 27 Proteinases inactivation of by cobra venom, 109 plant, 35 see also Enzymes, proteolytic Proteins, 119-54 acetylation of, 130 adsorption of water by, humidity and, ageing and changes in, 141 amino acid composition of, 41, 119, 123-27, 255, 259 analysis of, 119-27 biuret reaction, 127 electrophoretic, 139 artificial fibers of, 144 ascorbic oxidase activity and, 4, 427 of blood, 120 carbohydrate protection of, 424 cellular, 249 composition of, 444 crystalline, 136 deamination of, 130 deficiency of, liver changes and, denaturation of, 131-33, 512 by acid, 131 ageing and, 141 by alkali, 132 by guanidine, 142 by heat, 35, 131-32, 142 hydrolysis after, 36 rate of, 37 reversibility of, 132 sodium caprylate and, 35 by urea, 35, 132 derivatives of, 143-44 carcinogenic studies with, 144 isocyanate, 144 protein-formaldehyde, 144 use of, 143

Proteins (cont.) determination of colorimetric, 127 electrophoretic, 127 electrophoretic fraction of, 139 electrophoretic patterns of area analysis of, 140 ionic strength and, 140-41 fibrous combination with acids, 128 digestion of, 132 hydrolysis susceptibility of, 36 globular conversion to fibrous, 120, 129 digestion of, 132 hydrolysis susceptibility of, 36 stability of, pH and, 120 x-ray diffraction patterns of, 129 heating and changes in, 141 heat of solution of, 137 hydration of, 133 amino acid composition and, 135 "bound water," 135 measurement of, 135 molecular packing and, 135 structure and, 135 hydrolysis of, 125 amino acid changes and, 444 chromatographic analysis of hydrolysates, 125 enzymic, 35 formaldehyde and, 135 quotient of cleavage, 38 immunological properties of, 512 interaction with sodium dodecyl sulfate, electrophoretic study of, 143 mixtures of electrophoresis of, 141, 142 homogeneity of, determination of, 141 molecular weights of, 129, 136 multi-molecular adsorption of gases by, 138, 139 of muscle, interaction of, 119 niacin sparing effect of, 306 nitrogens in, 127 partial specific volume of in solutions, dilatometric determination of, 130 precipitation of, tannin and, 575 purification of, 119-27 respiratory, solubility of, 130 separation of, 119 specific volume of, change in, 136 stabilization of, 35 synthesis of, 247-50 isotope used in studies of, 247 tuberculin, 103

preparation of, 103

ultraviolet absorption by, 146

water vapor adsorption by, 138

Proteins (cont.) see also Enzymes; Viruses; and specific substances Protein metabolism, 247-72 enzymes and, 12 Protein structure, 127-31 determination of, 134 hydration and, 135 hydrogen formation in, 139 molecular dimensions, 130 molecular packing, 135 peptide bonds in, 130 formation of, 247, 248 hydrolysis of, 247 polar groups of, 144 x-ray studies of, 134, 135 see also Proteins Prothrombin, preparation of, 122 Protocatechuic acid, oxidation of, 424 Protoporphyrin, bacterial growth and, 378 Protoveratrine, cleavage products of, 186 Protozoa, nutritional requirements of, 387, 390 Protyrosinase, activation of, 4 bacterial growth and, 386-87 deamination of, ascorbic acid and, 601 in viruses, 580 Pyocyanine bacterial respiration and, 493 fungistatic effect of, 458 Pyrethrins activators of, 565 cost of, 543 deterioration during storage, 544 insecticidal action of, 543 synthesis of, 543 Pyrethrolone, structure of, 542 Pyrethrum insecticidal action of, 542 sensitivity to, 544 Pyridoxal, 384 activity of, 279 biological transamination and, 253 codecarboxylase activity of, 56 growth and, 279 decarboxylase activation and, 20 occurrence of, 385 transamination and, 58 Pyridoxal phosphate, coenzyme function of, 252 Pyridoxamine, 384 activity of, 279 formation of, 279 isomers of, 385 occurrence of, 385

Pyridoxamine (cont.) stability of, 278 transamination and, 58, 254 Pyridoxine assay of, 315 bacterial growth and, 383, 385 coenzyme function of, 59-60 deficiency of, 309 anemia and, 307 erythropoiesis and, 290 growth and, 307 kynurenine excretion and, 256 poliomyelitis susceptibility and, 309 thiamine and, 307 transamination and, 254 tryptophane metabolism and, 307 xanthurenic acid in urine and, 307 excretion of, environmental conditions and, 283-84 stability of, 278 transamination and, 59, 278 Pyrimidines bacterial growth and, 386-87 in viruses, 580 Pyrocatechol, pyrethrum activity and, Pyrogallol, pyrethrum activity of, 544 Pyrophosphatase, specificity of, 459 Pyrophosphate enzyme inactivation by, 39, 493 isolation of, 460 purification of, 459 Pyruvate acetate formation from, 487 assimilation of, 480 bacterial fermentation of, 477, 491 decarboxylation of, 53 phosphate and, 457 decomposition of, 477 hydrogen and, 484 iron enzyme and, 486 phosphate and, 483 phosphoroclastic, 487, 488 formate formation from, 487 formation of fluoride and, 420 in plants, 420 hyperglycemia and, 211 metabolism of, 212 oxidation of, 195, 236 monoacetylphosphate as product of, 239

reduction of, fluoride and, 491

alanine formation from, 255

carboxylation of, 478

Pyruvaldehyde, epinephrine inactivation

synthesis of, 476

by, 602

Pyruvic acid

utilization of, 480

d,

f,

f,

đ,

tion

Pyruvic acid (cont.) decarboxylation of, 54 by yeast, 463 fermentation of, 455 metabolism of, 44 oxidation of, 429, 455 yeast and, 440 plant respiration and, 421 reduction of, 52 Pyruvic oxidase, 8-9 activity of, 8 occurrence of, 9 Quinine bacterial luminescence and, 494 bacteriostatic activity of, 368 fat absorption and, 220 Radiation, solar dental caries and, 368 milk vitamin content and, 320 riboflavin destruction by, 278 vitamin stability and, 331 Radiation, ultraviolet mutations and, 390 virus inactivation and, 582 Radiation, x-ray mutations and, 390 virus inactivation and, 588 yeast fermentation and, 458 Raffinose fermentation of, 466 utilization of, bacterial, 482 Reineckate, insecticidal action of, 539 Renin antibodies to, 518 cytochrome oxidase activity and, 11preparation of, 355 Rennin crystallization of, 67, 120 properties of, 42 purification of, 120 Reproduction diet and, 226 vitamin A and, 302 Respiratory quotient fatty acid oxidation and, 201 insulin and, 210 Rh-factor, 516

in amniotic fluid, 520

acetal derivatives of, 278

microbiological method, 326

Rhodanese

Riboflavin

action of, 11 purification of, 11

assay of, 315

Riboflavin (cont.) bacterial growth and, 382-83 biosynthesis of, 289 deficiency of, 300, 309 anemia and, 306 dermatitis and, 306 diet and, 297 growth and, 306 ophthalmia and, 306 destruction of, by photolysis, 278 in eggs, 322 excretion of, 282 riboflavin intake and, 289-90 in fish, 326-27 processing and, 327 in leguminous seeds, 324 in meat, 321 processing and, 326 in milk breed and, 325 diet and, 320, 325 pasteurization and, 325 sunlight and, 320 oxidation of, bacterial, 483 in plants, 423 production of, iron and, 310 requirement for, 306 retention of in canned foods, 330 stability of in beer, 331 succinate derivatives of, 378 synthesis of cecectomy and, 289 by yeast, 292 in tea, 332 in vegetables, processing and, 329 in wheat kernel, 324 Ribonuclease molecular weights of crystals, 136 proteolytic activity of, 42 d-Ribonuclease, antigenic properties of, d-Ribose-5-phosphoric acid, fermentation products of, 447 Ricinoleic acid, distribution in tissues, Rickets, experimental, calcium-phosphorus ratio and, 304 Rotenone, 542 activation of, 566 biochemical role in plants, 548 distribution in plants, 547 extraction of, 547 insecticidal action of, 545, 546 structure of, 545 Rubidium, yeast fermentation and, 435 Sabadilla

insecticidal action of, 549

sternutative effect of, 549

Saccharose, fermentation of, 466 Salicylate, bacterial growth inhibition by, 381 Salmine adsorption of water by, 138 amino acid analysis of, 124 Sarmentogenin dehydrogenation of, 171 isolation of, 165 structure of, 171 Scilliroside isolation of, 172 structure of, 172 Sebacic acid, excretion of, 234 Serine bacterial fermentation of, 491 bioassay of, 123 deamination of, 492, 497 decarboxylation of, 253 desulfurase inactivation by, 47 determination of, 108, 222 in plasma, 108 pyruvate utilization and, 480 renal lesions and, 257 Serum acid-precipitable cenapses of, 110 antipneumococcal, 507 cholinesterase in barbiturates and, 66 epilepsy and, 66 histamine shock and, 66 vitamin C deficiency and, 66 electrophoretic pattern of, 143 isoagglutinins of, 513-14 lipase activity of, 228 precipitin formation in, 515 sedimentation pattern of, 129 syphilitic, electrophoretic patterns of, 513 Serum proteins denaturation of by guanidine hydrochloride, 132 denatured, serological activity of, 132 dielectric properties of, 138 fractional precipitation of, 121 isolation of, 120 properties of, 132 ultracentrifugal study of, 129 see also Albumin, serum; and Plasma proteins Shock anaphylactic, protection against, 526 blood constituents and, 25 from histamine, serum cholinesterase and, 66 Silicotungstate, insecticidal action of, Silver, carbohydrate metabolism and,

SUBJECT INDEX

Silver nitrate, yeast proteolysis and, 454 Sitostanol, 155 β-Sitosterol, constitution of, 155 Skin absorption through of DDT, 557 dermatitis pyrethrum and, 544 riboflavin deficiency and, 306 fat content of, diet and, 112 proteinase in, 39 Sodium, yeast fermentation and, 435 Sodium azide, bacterial respiration and, 493 Sodium caprylate, serum albumin denaturation and, 133 Sodium dodecyl sulfate, serum albumin denaturation by, 132 Sodium fluoride cholinesterase inhibition by, 562 yeast cell permeability to, 437 Sodium tetrathionate, reduction of, 11 Solanidine, 180 steroid skeleton in, 181 structure of, 186 Solasodine, structure of, 185 Solasonine, structure of, 181 proteins of, hemoglobin-like, 122 trypsin-inhibiting protein from, 42 Spermatozoa antigenic differences in, 519 carbohydrate metabolism of, 233 fat metabolism of, 233 glycolysis in, 200 lewisite action on, 14 motility of, 200 phospholipids in, 200 respiration of, 200 spermatogenesis, arginine and, 257 Sphingomyelin in liver, 223 phospholipase resistance of, 62 Spleen ketone body utilization by, 239 phospholipids of, adrenal insufficiency and, 233 weight of, immunization reactions and, 517 Starch constitution of, 75-80 degradation of, 84 products of, 418 dextrin formation from, 497 fermentation of, 484 formation of, photosynthesis and, 411 fractionation of, 75-77 hydrolysis of, 49, 61, 81 phosphorylation of in plants, 419 in plants, 418

of,

ro-

32

ma

26

ase

of,

d,

Starch (cont.) properties of, 497 separation of, 201 synthesis of, 84 x-ray studies of, 77-79 Stearate, liver metabolism and, 233 Stearate oxidase, activity of, 13 Stearic acid, preparation of, 103 Storculic acid, 102 Steroid hormones, kidney arginase content and, 43 Steroids, 155-92 see also Sterols and specific steroids Sterols of Calycanthus floridus chemical transformations in, 155-64 constitution of, 155-64 hydrogenation of, 157, 158 6-hydroxyl group of, spatial position of, 159-60 7-hydroxyl group of, configuration of, 161-62 hydroxylation of, 161 isolation of from natural sources, 155 isomerism in, 155-57 metabolism of, 164 separation of, chromatographic, 164 side-chain configuration in, 162-63 structure of, 155-64 x-ray studies of, 162 Stilbesterol, prostate metabolism and, 27 Strepogenin activity of, 389 bacterial growth and, 264 occurrence of, 264, 388-89 properties of, 389 Streptococci decarboxylase activity of, 55 fibrinolytic properties of, 39-40 transaminase activity of, culture medium composition and, 59 Streptothricin, bacterial inhibition by, 489 Strontium dentin formation and, 365 enamel development and, 365 yeast fermentation and, 435 Strophanthidin, 164 cardiac activity of, 176 reduction of, 166 structure of, 135 Strophanthidol preparation of, 166 structure of, 166 k-Strophanthol-y, preparation of, 166 Strophanthus kombé, cardiac glycosides from, 164 Succinate formation of, 487 isotope content of, 488

Succinate (cont.) oxidation of, bacterial, 479 plant respiration and, 428 Succinic acid dehydrogenation of, 456, 597 formation of, 456 in plants, 427 synthesis of, from carbon dioxide, 476 Succinic dehydrogenase, inactivation of, oxygen pressure and, 14 Sucrose analogues of, 497 decomposition of, bacterial, 498 dental caries and, 368 esterification of, 420 formation of by photosynthesis, 411 in plants, 87 glycosidic linkage in, 88 hydrolysis of, 8 metabolism of, 86-89 phosphorolysis of, 497 in plants, 418 sedimentation constant of, 134 structure of, 498 synthesis of, 50, 497 phosphate and, 87 utilization of, bacterial, 482 Sugars, see Glucose, of blood; Carbohydrates; Glycosides; and specific substances Sulfadiazine tooth formation and, 366 vitamin K formation and, 366 Sulfaguanidine, antibacterial action of, 289 Sulfanilamide acetylation of, 24, 238, 248 bacteriostatic effect of, p-aminobenzoic acid and, 457 carbonic anhydrase inhibition by, 52 eggshell calcification and, 53 Sulfathiazole, yeast carboxylase inhibi-

tion by, 277

acetylation of, 24

pneumonia and, 515

structure of, 545

Sulfonamides

Sumatrol

Sulfide, enzyme poisoning by, 423, 426

activity of, p-aminobenzoic acid and,

antibiotic effect of, structure and, 381 bacterial growth inhibition by, 386

thyroid hormone formation and, 11 virus infectivity and, 581

Sulfur, utilization of by bacteria, 475

carboxylase activity and, 54

insecticidal action of, 545

Sweat, ascorbic acid in, 281
Synapses, resistance of, DDT and, 564
Syphilis
antibodies to, 515
enamel hypoplasia and, 367
serological tests for, 109
antibodies in, 512
false positive results, 513
serum electrophoretic patterns with, 513

T

Takadiastase, action of, 441 d-Talose, 448 Tannin, protein precipitation by, 575 Tartaric acid, oxidation of in plants, 427 Tea, vitamin content of, 332 Teeth, 361-74 bleaching of cadmium and, 365 vitamin A deficiency and, 365 calcification of, 361 anoxia and, 367 glycogen and, 362 magnesium deficiency and, 365 phosphatase and, 362, 363 proteolytic enzymes and, 362 vitamin C deficiency and, 366 vitamin D and, 362, 365 caries, 367-70 in animals, 367-68 diet and, 368 fluorides and, 368-69 iodoacetate and, 369 proteolytic enzymes and, 369 sugar and, 368 sunshine and, 368 urea and, 370 vitamin A and, 368 vitamin D and, 368 dentin calcium/phosphorus ratio and, 364 disease and, 366 formation, diet and, 286 maturation of, 365 depigmentation of iron metabolism and, 366 vitamin E deficiency and, 287, 366 electron microscopic studies of, 370 enamel, acid solubility of, 368 enamel development, 361 manganese and, 365 strontium and, 365 enamel formation, stages of, 361-62 enamel hypoplasia, disease and, 367 formation of, 361-63 diet and, 363 fluorine and, 364 magnesium deficiency and, 365 mineral metabolism and, 363-65

Thiamine (cont.)

Teeth (cont.) formation of (cont.) sulfadiazine and, 366 vitamins and, 365-66 growth of, hypophysectomy and, 366 hormones and, 366 protein deposition in, 361 radioactive phosphorus uptake by, 367 Tellurium, yeast fermentation and, 435 Temperature bacterial glucose assimilation and, 482 influenzal virus disintegration and, veast fermentation and, 446 Temperature, environmental ascorbic acid excretion and, 281 caloric requirement and, 305 chloroplast activity and, 402 thiamine requirement and, 305 Tephrosin insecticidal action of, 545 structure of, 545 Testis adrenotropic hormone and, 349 anatomical changes in, arginine deficiency and, 257 Testosterone, kidney arginase content and. 43 Tetanus toxin, preparation of, 524 Tetrathionate, bacterial metabolism and, Thallium, yeast fermentation and, 435 Theobromine, plasma fibrinogen and, Theophylline, plasma fibrinogen and, 266 Thiaminase action of, 282 occurrence of, 282 Thiamine absorption of, 282, 299 analogues of, 277 assay methods for, 312 audiogenic fits and, 289 availability of, 282, 288, 305 fuller's earth and, 282 kaolin and, 282 bacterial growth and, 383 in blood, 289 in cereals, 331-32 loss during storage, 324 deficiency of, 309 cardiac arrhythmias and, 288 liver decarboxylase activity and, 57 poliomyelitis resistance and, 231, 305 thiamine excretion and, 288 destruction of, 282 temperature and, 326

determination of colorimetric method for, 314 in urine, 315 in eggs, 321 elimination of, fiber intake and, 282 estimation of, polarographic method for, 317 excretion of, pregnancy and, 300 in leguminous seeds, 324 in meat, 321 processing and, 325-26 metabolism of, yeast and, 299 in milk diet and, 320 pasteurization and, 325 pyridoxine deficiency and, 307 requirement for, 299 temperature and, 305 retention of in canned foods, 330 in skin, wound healing and, 289 stability of in beer, 331 storage of, 306 synthesis of in digestive tract, 282 thermal destruction of, 278 urea synthesis and, 44 in vegetables processing and, 329 retention of, 329 in wheat, 324 localization of in kernel, 324 work output and, 289 yeast phosphatase inhibition by, 459 see also Diphosphothiamine and Vitamin B complex Thiocyanates, ovicidal action of, 551-52 Thiomethylpentose, in yeast, 440 Thionine, 422 Thiosulfate, bacterial fluorescence and. 407 Thiouracil bacterial growth inhibition by, 387 thyroid hormone formation and, 11 Threonine bacterial fermentation of, 491 bioassay of, 123 deamination of, 492 growth and, 263 in yeast, 444 Thrombin, 46-47 action of, 46 fibrin clotting and, 39 Thymidine, bacterial growth and, 388 Thymine analogues of, 387 nutritive value of, 319 Thymus gland, cholinesterase in, 65 Thyroid gland, 351-52 activity of, diabetes mellitus and, 352 cytochrome oxidase activity of, 11

Thyroid gland (cont.) hormone, formation of, 11 hyperthyroidism, tooth changes and, hypothyroidism, tissue respiration and,

iodine content of, colorimetric determination of, 352

thyroidectomy, pituitary renotropic

effect and, 349 Thyroxine activity of, 352 biosynthesis of, 352 immunochemistry of, 352 pituitary renotropic effect and, 349 production of, 352 Thyrothricin, fungistatic effect of, 458

Tissue metabolism, 25-28 oxygen pressure and, 14 oxygen tension and, 26 rate of, 26

Tissues hexokinase activity of, 51 lipids of, 109-13 determination of, 110

Tocopherols anoxia resistance and, 287 determination of, 313 fatty acid utilization and, 231 in tissues, age and, 313 utilization of, inositol and, 281

a-Tocopherol acetylcholine synthesis and, 276 bacterial growth and, 229 homologues of, 276

Tongue, glossitis niacin therapy and, 301 pregnancy and, 300

Torula, 438 Toxicarol insecticidal action of, 545 structure of, 545 Transaminase, 58-60 activity of, 13, 21, 254

specificity of, 21

vitamin B, deficiency and, 59 from bacteria, 58 electrophoretic mobility of, 21 isolation of, 254

vitamin Be in, 59 Transphosphorylations, 50-52 Trehalose, yeast metabolism and, 445 Tricarboxylic acid cycle

individual reactions of, 194 in plant respiration, 427-28 Trichloroacetonitrile

boiling point of, 550 insecticidal action of, 550

lachrymatory effect of, 550

Trimethylamine, occurrence of in marine phylla, 266 Triosephosphate

lactic acid formation from, 489 oxidation of, 423, 428 anaerobic, 429

enzyme systems in, 429 Triphosphatase action of, 461

in veast, 461 Triphosphopyridine nucleotide, bacterial growth and, 380

Trypanosomes, lewisite action on, 14 Tryptophane, 256-57 analysis of, colorimetric, 124 bioassay of, 123

color reaction with fructose, 440 deficiency of

nitrogen balance and, 256 plasma protein production and. 251

excretion of, 256 growth and, 263 metabolism of, pyridoxine deficiency and, 307 virus reactivation and, 587

in yeast, 444 dl-Tryptophane, synthesis of, 145 Trypsin

activity of, 13, 37, 264, 524 hormone inactivation by, 351 phosphorylase inactivation by, 48 pituitary growth hormone and, 349 protein hydrolysis by, 36

virus infectivity and, 586 Tuberculin antigenic activity of, 524 inactivation of, 524

molecular weight of, 524 proteins of, 524

Tuberculosis enamel hypoplasia and, 367 liver fatty infiltration and, 111 plasma lipids and, 110

Typhus, diagnosis of, complement fixation test and, 524

Tyramine deamination of, 593, 604 detoxication of, 603 esterification of, 610 inactivation of, 602 oxidation of, 11, 598 rate of, 600

Tyrosinase, 3 action of, 3, 508 blood pressure in hypertension and, 604 epinephrine oxidation by, 598 hormone inactivation by, 351

precipitation of by antibodies, 508

Tyrosine
analysis of, colorimetric, 124
bioassay of, 124
chymotrypsin activity and, 37
decarboxylation of, 252
determination of, enzymic, 57
dihydroxyphenylalanine formation
from, 599
metabolism of, 256
oxidation of, 424
synthesis of, 258
in yeast, 444

U

Uranium, yeast growth and, 437 Urea, 262-63 antitoxin inactivation by, 507 dental caries and, 370 protein denaturation by, 132 serum albumin denaturation by, 133 synthesis of, 44-45 caffeine and, 44 from glutamine, 45 urinary, formation of, 262 Urease, activity of, 13 Uric acid, oxidation of, 9 Uricase, activity of, 9, 13 Urine ascorbic acid content of, 314 temperature and, 281 creatinuria, muscular dystrophy and, 281 glycosuria alloxan and, 205 insulin and, 207 pancreatectomy and, 205 phlorhizin and, 212 steroids and, 207 ketonuria alloxan diabetes and, 240 insulin and, 210 pH of, anoxia and, 287 pregnancy, gonadotropic activity of, thiamine in, determination of, 315 Ursodesoxycholic acid, 161 Uterus, contraction of, histamine and, 529

V-factor, in erythrocytes, 379
Vaccines, immunization with, 508
Valine
bioassay of, 123
deamination of, 23, 496–97
growth and, 263
pyruvate utilization and, 480
in yeast, 444
I-Valylglycine, isolation of, 145
Vanadium pentoxide, yeast sporulation
and, 440

Vasopressin, enzymes and, 351 Veratridine insecticidal action of, 549 structure of, 549 Veratrine, insecticidal action of, 549 Viruses. 573-92 adsorption of, 587 animal, 573 chemical composition of, 510 properties of, 574 purification of, 510 antigen precipitation by, 512 associations with host, 586-87 bacterial, 573 inactivation of, 587 bushy stunt, 512 molecular weights of crystals, 136 preparation of, 586 properties of, 586 classification of, 573 composition of nucleic acids in, 580 phosphorus in, 579, 583 purines in, 580 pyrimidines in, 580 crystallization of, 585 differentiation of, 574 distemper, antibodies to, 515 electron micrographs of, 578 fixation of, 587 hydration of, 133, 134 inactivation of, x-ray and, 588 infectivity of, trypsin digestion and. 586 influenza, 475, 577-82 antibody response to, 515 antigenic activity of, 580 chemical composition of, 579-80 complement fixation by, 577 densities of, 134 disintegration of, 577 electron micrographs of, 579 enzyme activity of, 581 erythrocyte agglutination by, 577 inactivation of, 582 infectivity of, 577, 580, 581 isoelectric point of, 581 lipid content of, 579, 580 molecular size of, 577 phosphorus content of, 579 purification of, 509, 577 reactivity of, 580 sedimentation constant of, 577, 579 stability of, 580-81 ultracentrifugation of, 580, 588 liberation of, 586-87 molecular size of, 574 mutual antagonism of, 582 nucleoproteins of, 574, 579

particle size, determination of, 589

Viruses (cont.) particle weights, 573 plant, 573, 585 chemical classification of, 575 classification of, 576 insect-transmitted, 585 morphology of, 576 properties of, 574 poliomyelitis, 582-83 electron micrographs of, 582 excretion of, 583 infectivity of, 586 phosphorus in, 583 properties of, 576 purification of, 582 sedimentation constant of, 582 production of, 11 psittacosis-lymphogranuloma, immunological studies on, 525 rabbit papilloma, 588 sedimentation constants of, 133 separation of, ultracentrifugation and, silkworm jaundice, sedimentation constant of, 573 solubility of, 586 sonic disintegration of, 587 southern bean mosaic, 121 stability of, pH and, 581 tobacco mosaic, 583-84 aggregation of, 584 electron microscope studies of, 128, homologous antibody of, 505-6 inactivation of, 588 molecular weight of, 129, 506 nucleic acids in, 584 properties of, 576 sedimentation constant of, 583 viscosity of, 583 tobacco necrosis, 585 molecular weight of, 585 sedimentation constant of, 585 stability of, 585 x-ray examination of, 129 vaccinia, 586 x-ray measurements of, 585 Vision, ophthalmia, riboflavin deficiency and, 306 Vitamin A in butter, 325 in butterfat, 285 in cod liver oil, 326 deficiency of diet and, 297 ketosis and, 303 mitotic rate and, 286 tooth bleaching and, 365 tooth formation and, 365 dental caries and, 368

Vitamin A (cont.) estimation of colorimetric method for, 316 in colostrum, 302 multiple-level bioassay method for, spectrophotometric method for, 316 in fish liver oils, 316 growth and, 302 hypervitaminosis of bone fragility and, 302 diarrhea and, 304 hemorrhages and, 302 isomers of, 275 in milk, 320, 325 vitamin A intake and, 297 in oleomargarine, 316 in plasma, 280, 302 reproduction and, 302 requirement for, 298, 303 storage of in liver, 231, 303 soybean lecithin and, 285 vitamin A in diet and, 285 utilization of, vitamin E and, 304 vitamers of, 275 Vitamin Be anemia and, 292 assay of, 318 bacterial growth and, 387-88 deficiency of, paralysis and, 292 in liver, 291-92, 387 production of, 294 from yeast, 387 Vitamin Be, 279 amino acid decarboxylation and, 1 assay of, 385 bacterial decarboxylase activity and, bacterial growth and, 383-86 biological transamination and, 253 components of, 383 deficiency of, transaminase activity and, 22, 59 forms of, 385 Vitamin B10, 295 Vitamin B₁₁, 295 Vitamin B complex assay of, biological method, 331 deficiency of, effects of, 298 microbiological assay for, 319 requirements for, 298-99 synthesis of, corn oil and, 309 in vegetables, processing and, 329-30 in wines, 327 Vitamin C deficiency of adrenal insufficiency and, 230 serum cholinesterase and, 66 tooth calcification and, 366

Vitamin D bone mineralization and, 276 calcium absorption and, 276 calcium deposition and, 276 in cod liver oil, 326 deficiency of bone resorption and, 286 tooth structure and, 286 dental caries and, 368 estimation of, 311 in milk, 280 provitamins of, 275 renal failure and, 300 tissue calcification and, 300 tooth calcification and, 362, 365 toxicity of, 365-66 Vitamin D, antirachitic effect of, 300 inactivation of, 287 Vitamin D₃, inactivation of, 287 Vitamin E deficiency of blood pressure and, 287 muscle pigmentation and, 287 muscular dystrophy and, 66 reproductive system damage and, 287 tooth depigmentation and, 287, 366 vitamin A utilization and, 304 see also Tocopherols Vitamin K acid production by oral bacteria and, 368 deficiency of, tooth formation and, 366 dental caries and, 368 structural analogues of, 293 Vitamin K₁, 276 Vitamin M, 292 Vitamin P, 295 Vitamins, 273-346

6

"antistiffness factor," 294 in cereals, 324 determination of, microbiological method, 375 destruction of sunlight and, 320 temperature and, 321 fat metabolism and, 230-31 fat-soluble biological assay of, 311 chemical aspects of, 274-76 chemical assay of, 312-16 physiological aspects of, 280-81 food sources of natural foods, 319-24 processed foods, 325-32 in fruits, 321 hemoglobin maintenance factor, 295 in meats, 321-22 in milk, lactation stage and, 320

Vitamins (cont.) requirement for, fat and, 309 stability of, 322 in canned foods, 330 tooth development and, 365-66 in vegetables, 322-24 processing and, 328-31 water-soluble biological assay of, 312 chemical aspects of, 276-80 physiological aspects of, 281-84 requirements for, 375

Water absorption of by proteins, 134-35 deprivation of, plasma lipids and, 110 as hydrogen donor in photosynthesis, 410 photodecomposition of, 397 Wool, adsorption isotherm of, 139 Work, industrial, absenteeism, vitamin supplementation and, 296

Xanthine, bacterial growth and, 386 Xanthophyll, 284 in snake plasma, 306 Xanthurenic acid excretion of, pyridoxine deficiency and, 256 in urine, 307 Xylans, bacterial cellulose decomposition and, 491 Xylose, bacterial fermentation of, 477 d-Xylose, glycosides of, 176 d-Xylose phosphoric acid, fermentation of, 447

Yeast, 435-74 acetic acid decomposition by, 456 acetoin accumulation by, 464 adaptation of, 439, 466 to galactose fermentation, genetic control of, 199 p-aminobenzoic acid in, 457 amino acid content of, 444 aneurin enrichment of, 438 autolysis of, 443 biotin requirement of, 376 capsulated, 203 carbohydrate reserves in, 199 carbohydrate storage in, 445 carbohydrate utilization by, 453 carbon dioxide fixation by, 454 carboxylase of, 53 dormancy of, 445 nucleic acid content of, 458

Yeast (cont.) cells (cont.) permeability of, 437 reactivation of, 445 sugar absorption by, 453 color reactions of, 440-41 conjugation, 465 copper content of, 436 cytochrome content of, 425 cytolysis of, 444 dehydrogenases of, 422, 423 dried, 454 extraction of, 459 fat content of, 457 ducitol in, 444 ergosterol formation and, 443 fat content of, 441 fat formation by, 456 fat storage in, 445 fatty degeneration of, 443 fermentation of anaerobic alcoholic, 445 cell structure and, 464 fructose-1,6-diphosphate and, 439 glycerol formation from, 448-49 heat of reaction of, 458 minerals and, 435 temperature and, 446 x-ray and, 458 fluoride and, 437 genetics of, 466-67 glucose oxidation by, 440 glycogen from, 441 growth of, 436 biotin and, 279 carbon dioxide and, 455 minerals and, 436 nicotinic acid and, 379 glucose fermentation in, adenylpyrophosphatase and, 199 glucose utilization by, 444 glycogen deposition in, 199 inositol content of, 442 lactose fermentation and, 446 lipids of, extraction of, 109 metabolism of, 1, 28, 436, 444 arsenate and, 438 endogenous, 436

end products of, 454 trehalose and, 445

morphology of, 464

mutations in, 465-66

mineral requirements of, 435-40

Yeast (cont.) new strains of, 465 nitrogen content of, 444 nutritional requirements of, 387 organic constituents of, 440-64 paraffine utilization by, 457 phosphatases of, 443, 458-64 culture medium and, 459 phosphorylase activity of, 50 phosphorylation of, 450 plasmolysis of, 461 protein content of, 438 proteolytic decomposition of during drying, 454 pyruvic acid decarboxylation by, 463 respiration of, 199 mercury and, 436 oxygen pressure and, 437 sporulation of, vanadium pentoxide and, 440 sterol content of, 442 structure of, ring specificity of, 446 sulfur content of, 444 thiamine requirement of, 383, 438 uranium content of, 437 ultrasonic waves and, 458 vitamin synthesis by, 292 zinc content of, 436 zylose utilization by, 444

Z

Zein double flow refraction of, 130 molecular dimensions of, 129-30 partial specific volume of, 130 Zinc in yeast, 436 yeast fermentation and, 435 Zylose, utilization of by yeast, 444 Zymase, extraction of from yeast, 454 Zymogen, activation of, 40 Zymohexase in muscle, 420 in plants, 420 preparation of, 449 solubility of, 449 stability of, 449 Zymohexose, degradation of, 446 Zymosterol isomers of, 442 transformation products of, 443 from yeast, 442

ERRATA

At Professor Neuberg's request the following corrections and alterations in his review (pp. 435 to 474) are brought to the attention of the reader:

Page 435, subhead: for MINERAL REQUIREMENTS read

MINERAL CONTENT AND REQUIREMENT

Page 435, line 12 from bottom: for uranous oxide read uranyl.

Page 435, line 6 from bottom: for Verzar read Verzár. Page 437, line 4: insert per cent after 10-4 and 10-5.

Page 438, line 21: after degradation insert (Buchner and Harden).

Page 438, line 14 from bottom: for has also stated read already took in consideration.

Page 438, line 12 from bottom: for immediate read rapid.

Page 438, last line: after diphosphate insert (Neuberg & Leibowitz).

Page 439, line 13: for Bromel read Brömel.

ng

63

6

54

Page 439, line 5 from bottom and last line also: for arsenite read arsenate.

Page 440, line 14 from bottom: for Willstatter read Willstätter.

Page 441, mid page: for Teauloz read Jeanloz.

Page 441, line 17 from bottom: delete sentence beginning By oxidation.

Page 441, line 11 from bottom: for Garzully-Janke read Garzuly-Janke. Page 442, line 9 from bottom: for first formula in line read $C_{30}H_{51}OCl$.

Page 443, line 18 from bottom: for Rimington (73, 74) has read Rimington (73) and Kench & Wilkinson (74) have.

Page 443, lines 5 and 6 from bottom: for sulfate read hydrosulfite.

Page 444, line 13: for components read components-.

Page 444, line 21: for of the read of.

Page 444, line 4 from bottom: for zylose read xylose.

Page 446, lines 5 and 6: for is fermented read is said to ferment. Page 446, line 13 from bottom: for furanose read -furanose.

Page 446, line 6 from bottom: for also fermented in its furanose modification read fermented in both its modifications equally.

Page 447, line 6: for 5-d-fructonese read 5-d-fructonose.

Page 447, line 4 from bottom: for glycollicaldehyde read glycolaldehyde.

Page 447, line 2 from bottom: for glycollic read glycolic.

Page 448, line 2: for glycollicaldehyde read glycolaldehyde.

Page 448, line 19 from bottom: for objective read result.

Page 449, line 20: for Bakers' yeast read Some bakers' yeasts.

Page 449, line 13 from bottom: for $[C_6H_{10}O_4(PO_4H)]_2$ Ba read $C_8H_{10}O_4(PO_4H)_2$ Ba.

Page 449, line 11 from bottom: for -4.04° to 4.15° read +4.04° to +4.15°.

Page 450, line 12: for galactopyranose-1-monophosphate read d-galactopyranose-1-monophosphate.

Page 450, line 22: for & read and.

Page 450, line 16 from bottom: for a- read calcium.

Page 451, line 14: for to Neuberg read to I. S. Neuberg.

- Page 452, line 17: for sugar yeast read sugar by yeast.
- Page 452, line 18: for reserved read critical.
- Page 452, line 6 from bottom: for 20, read 20,.
- Page 452, line 5 from bottom: for O2 read 2 O2.
- Page 452, line 2 from bottom: for (CH2O) read CH2O.
- Page 453, line 18 from bottom: for reaction read reactions.
- Page 453, line 4 from bottom: for discussed on page 464 read the course of which is known.
- Page 454, line 18: for impossible read unlikely.
- Page 454, line 24: for 21 read 2 l.
- Page 454, line 11 from bottom: for manganate read permanganate.
- Page 455, line 20: for 74 read 174.
- Page 456, line 7: delete (see p. 464).
- Page 456, line 12 from bottom: for & read and.
- Page 460, line 8: for pyrophosphate read pyrophosphatase.
- Page 460, line 19: for metaphosphate read metaphosphoric acid.
- Page 461, line 17 from bottom: for page 000 read above.
- Page 462, line 20: for C(NHCH2) · CH2 read CH(NHCH2) · CH3.
- Page 463, line 12 from bottom: insert comma after p-toluylaldehyde.
- Page 464, line 1: after yeast. insert i.e. $[\alpha]_D^{19} = 14.1^\circ$ (unpublished).
- Page 464, line 25: for (225) and refined (226) read and refined (225, 226).
- Page 464, line 26: for Tomiyasu read Tomiyashu.
- Page 464, line 27: for Reberg read Raborg and for 1 ml. read 0.8 µg. per ml.
- Page 464, subhead: change to Morphology, Genetics, etc.
- Page 465, line 1: for in intact read of intact.
- Page 465, line 8 from bottom: delete S,.
- Page 465, line 7 from bottom: change sentence to read Copulation of R cells is possible: R and S forms arise.
- Page 467, line 9: for position, read position1,
- Page 467, line 19: for phenomenon1 read phenomenon.
- Page 467: for 4. Neuberg read 4. For literature see Neuberg.
- Page 468, reference 20: after 21A insert No. 4.
- Page 468, reference 24: after 16A insert Nos. 16 and 20.
- Page 469, reference 51: for Pryde, T. read Pryde, J.
- Page 469, reference 52: for (1942) read (1945).
- Page 469, reference 68: for Zorkorczy read Zorkorczy.
- Page 469, reference 70: for T. read J.
- Page 469, reference 74: for T. read J.
- Page 469, reference 76: delete Russian reference; retain Chem. Abstracts reference.
- Page 469, reference 79: for Vaidya read Vaydia; for German reference insert instead quoted by Sperber, reference 84.
- Page 469, reference 84: after 21A insert No. 3.
- Page 469, reference 87: for T. read J.
- Page 470, reference 96: change to read Pringsheim, H., and Kolodny, S., Ber. deut. chem. Ges., 59, 1135 (1926).
- Page 470, reference 99: for 2466 read 2486.

- Page 470, reference 103: for T. read J.
- Page 470, reference 115: for T. read I.

of

nl.

lls

- Page 472, reference 174: after 14B insert Nos. 13 and 29.
- Page 472, reference 186: after 15A insert No. 12.
- Page 472, reference 196: for Biol. read Geol.; after 16B insert No. 16.
- Page 472, reference 201: for Biol. read Geol.; after 16A insert No. 5.
- Page 472, reference 204: change to Cori, C. F., and Cori, G. T., Ann. Rev. Biochem., 10, 151 (1941).
- Page 472: change present reference 204 to 204a.
- Page 473, reference 206: for Myrbach read Myrback.
- Page 473, reference 222: change journal citation 197, 257 (1928); 201, 206 (1928).
- Page 474, reference 259: for mikrobiol, read Mikrobiol.
- Page 474, reference 263: for Hongo read Hongo.
- Page 474, reference 273: for Lindgren, G., read Lindegren, G.
- Page 474, reference 278: for Custers, M. T. T., read Custers, M. T. J.